

RESEARCH REPORT

AN EXPLORATION OF PHYSICIAN BEHAVIOR
IN SECONDARY LABOR MARKETS

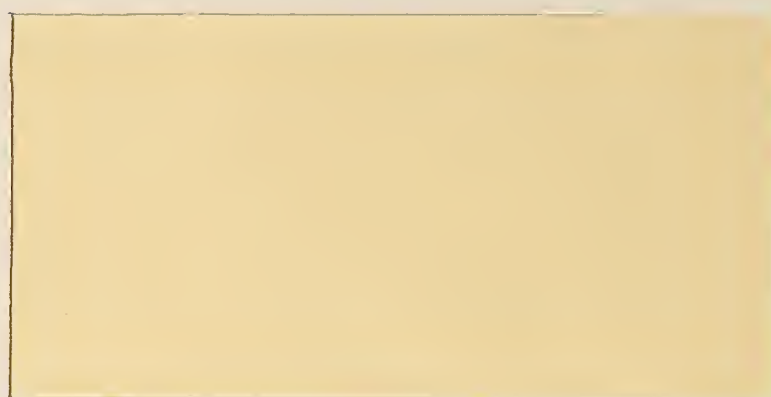
Final Report

November 30, 1979

by
Janet B. Mitchell, Ph.D.



HEALTH CARE RESEARCH
DIVISION OF MEDICINE
BOSTON UNIVERSITY



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Abstract

Policymakers have become increasingly concerned that certain segments of the elderly population may not be receiving adequate medical care. Many physicians have abdicated responsibility for nursing home patients, seriously jeopardizing the quality of care as a result. In addition, fewer and fewer physicians are willing to make house calls, reducing access for the home bound elderly. This study examined the factors influencing the physician's decision to make these types of visits. Only 47 percent of sample physicians had made any nursing home visits during the previous week of practice, and 43 percent any house calls.

Nursing home and house call visits constitute a secondary market for physician services, characterized by low "pay", poor working conditions and fewer opportunities for advancement. Physicians enter this market only when forced to do so by competition. As a result, physicians in the nursing home and house call markets were found to be less well trained on average than other physicians. In particular, they tended to be older, less specialized, and (in the case of nursing home visits) Third World medical school graduates. Although nursing home and house call reimbursement levels averaged as much or more as those for office visits, furthermore, they were apparently still too low to offset the high travel costs associated with making these two types of visits. Physicians were more likely to make nursing home visits and house calls when travel distances were shorter.

The net impact of current federal policy on access of the elderly to medical care is uncertain. The Health Professions Educational Assistance Act will serve to increase physician services to the secondary market. At the same time, however, by reducing the influx of FMGs, this act may restrict the supply of nursing home visits. Finally, only very large (but indeterminate) increases in reimbursement levels may induce physicians into the secondary market.

Acknowledgements

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I. STATEMENT OF THE PROBLEM

"I hate to go to a nursing home. It has not been unusual for me to sit on a chair that is covered with urine. You just don't want to sit down. You are afraid to touch things. Patients are confused, and they will wipe stool on a doorknob. The taking care of many of the patients in nursing homes is a difficult job and you have to be very dedicated."

"The nursing home can be a depressing place, especially if you are approaching the nursing home age yourself. When you see these people, you think "this is going to happen to me," and you may unconsciously avoid the nursing home for this reason. And too, with the elderly patient, it is easy to get frozen into a diagnosis, then stop thinking about the patient anymore."

---Physician testimony to the
Subcommittee on Long-Term
Care, U.S. Senate Special
Committee on Aging, 1975.

Medicare and Medicaid were enacted in 1965 with the intent of improving access to "mainstream" medicine for the poor and elderly. Besides receiving more services than before, such persons would be able to rely more on community physicians for care and less on institutional providers. The lack of continuity in emergency rooms and outpatient departments was felt to jeopardize the quality of medical care; the private physician could more easily coordinate services and follow his patients through hospital and nursing home admissions. Despite the notable success of Medicare and Medicaid in increasing medical care utilization for millions of Americans, several gaps remain. First, many physicians have abdicated responsibility for nursing home patients, seriously jeopardizing the quality of care as a result. Second, fewer and fewer physicians are willing to make housecalls, reducing access for the homebound elderly.

Physician unwillingness to make nursing home visits is of particular policy concern, given the poor health status of this patient population. The absence of physicians means that current treatment may go unmonitored, and new conditions undiagnosed. Drug orders are often renewed by telephone, with no notation in the medical record. Studies of nursing homes throughout the country report the following types of problems, for example (U.S. Senate Special Committee on Aging, 1975). As many as 30 - 40 percent of patients taking digitalis or insulin have no documented history of heart disease or diabetes, respectively. The average patient takes four to seven different drugs; some are taking amphetamines and sedatives at the same time. Infectious diseases may go unreported, sometimes with tragic results, as shown in the Baltimore salmonella epidemic of 1970. Death certificates may be signed without first viewing the bodies.

The absence of physicians not only results in poor medical care, it also results in poor nursing care. Nurses and aides go generally unsupervised. At the same time, they are forced to assume many responsibilities (e.g., drug management), for which they are not adequately trained.

The low net marginal revenue yielded by nursing home visits and house calls may explain in part the unwillingness of physicians to make these kinds of visits. In addition, physician distaste for nursing homes may be so strong, as evidenced in the comments above, that they avoid these settings as much as possible. Nursing homes become a secondary physician market populated by older physicians, general practitioners and foreign medical graduates, i.e., those physicians with inferior and/or obsolescent technical skills.

This project seeks to address the role of the physician and access to, and quality of, medical care in each of these areas: (1) physician willingness to see patients in nursing homes; and (2) physician willingness to make house calls.

II. NURSING HOME VISITS AND HOUSE CALLS: LITERATURE REVIEW

Physician Visits to Nursing Homes

When Medicare and Medicaid were enacted in 1965, they included skilled nursing home (SNF) benefits to provide convalescent and rehabilitative care to the chronically ill and elderly. From the outset, these long-term care programs have been plagued with surprises. First, together they account for a large and ever-growing portion of the federal health care budget. Second, nursing homes throughout the country have been accused of fraud, abuse, patient neglect, and generally low quality care. Because of its many eligibility and benefit restrictions, Medicare currently provides financing for only a small percentage of total SNF patient days. In 1976, Medicare paid approximately \$275 million to nursing homes, about two percent of its budget (Moss and Halamandris, 1977). Nursing home expenditures under Medicaid, however, are enormous and growing rapidly. In 1975, Medicaid paid \$4.3 billion to nursing homes, one-third of its entire budget. This represented a fifty percent increase over Medicaid nursing home expenditures in 1973 (CBO, 1977). (These figures represent payments to nursing home operators only; they do not include payments for physician services.)

As the federal long-term care budget has grown, so has the catalog of nursing home abuses. Government, labor union, and private studies have systematically documented substandard levels of care in many nursing homes (U.S. Senate Committee on Aging, 1974; AFL-CIO, 1977; Townsend, 1971). Reimbursement rates are alleged to be inadequate for assuring even a minimal level of care (Ruchlin et al., 1975). Flat fee systems used in many states encourage nursing homes to cut back services in order to maintain profits. In order to encourage efficiency and at the same time assure minimum levels of care, federal policymakers have begun to experiment with alternative payment systems, such as prospective reimbursement.

Alternative reimbursement mechanisms for nursing homes, while promising, do not address the issue of inadequate medical care, i.e. care provided by physicians. Physicians have been noted by their absence from nursing homes (Pastore et al., 1968; Solon, 1963; Moss and Halamandris, 1977). Not only are nursing homes visited relatively infrequently by physicians, but few physicians in a given community make any nursing home visits whatever. A study in one Pennsylvania county found that only 14 percent of all community physicians visited nursing homes (Solon and Greenawalt, 1974).

As in hospitals, most medical care in nursing homes is provided by private attending physicians. A National Center for Health Statistics survey of nursing homes found that 71 percent of all residents were

treated by their own physicians; in the remaining cases, physicians were provided by the facilities themselves, either on staff or on contract (NCHS, 1977). Although a nursing home patient may have a physician of record, this does not guarantee that physician services are actually provided. Nursing staff complain of the failure of physicians to respond to emergency telephone calls, reluctance of covering physicians to come to the nursing home in an emergency, medication prescriptions by telephone, and a tendency of physicians to sign death certificates without viewing the body (Miller et al., 1972). When physicians do come to the nursing home, visits are often perfunctory and performed on an assembly-line basis (Moss and Halamandris, 1977).

Why are physicians unwilling to treat nursing home patients? Most critics have identified the patient casemix in nursing homes, low reimbursement levels, and excessive administrative requirements, as factors in the absence of physicians. Physicians may be reluctant to become involved with nursing home patients, because they view such cases as hopeless and unrewarding. (Frank, 1972; Kane et al., 1976; Miller et al., 1976). Older patients are seen as less challenging and less interesting, unlike hospital patients. The very environment of the nursing home may be seen as gloomy and depressing. Physicians complain of inadequate or incompetent nursing staff, dirty facilities, and disoriented patients.

Federal regulations may also encourage the physician to stay away from nursing homes. Medicare and Medicaid require that nursing home patients be visited by a physician at least once every 30 days to renew orders and prescriptions. More frequent visits usually are made only when a patient has experienced an acute episode or when a death certificate needs to be signed. All too often, the hospital emergency room is used to provide acute care services. Intended as a floor to assure adequate physician visits, this 30-day requirement has become a ceiling on quality. Analysis of Massachusetts nursing homes, for example, showed that physician visits clustered at 30-day intervals (Willemain and Mark, 1978).

Finally, reimbursement levels for nursing home visits may be too low to offset the costs of travel and inconvenience to the physician. In the case of Medicaid, administrative "red tape" may also be a strong disincentive to visit nursing home patients (U.S. Senate Special Committee on Aging, 1975).

Evidence on physician visits to nursing homes is anecdotal and fragmented in nature. No studies have been conducted to evaluate the relative importance of factors influencing physician involvement, especially those most subject to policy manipulation such as fee schedules. Policy options such as prospective reimbursement can not completely guarantee quality nursing home care. Encouraging community physicians to follow their patients in the nursing home is a necessary addition. One means for doing this may be to adjust nursing home visit fees; a less direct, but possibly equally effective, tool may be

to reduce the collection costs associated with obtaining reimbursement under Medicaid. Policies directed toward the reallocation of residencies, such as the 1976 Health Professions Educational Assistance Act, may also help if primary care practitioners are more likely to visit nursing homes.

Empirical evidence on Medicare beneficiaries suggest that skilled nursing facilities are substitutes for more costly inpatient care (Feldstein, 1971; Gornick, 1975). The extent of substitution may be limited, however, by physician resistance to nursing home care. Reimbursement schedules with a strong bias towards acute care also encourage hospital stays. As a result, many patients may be inappropriately placed in a higher level of care than is medically necessary.

More intensive physician services in nursing homes may also result in total system savings, if medical problems are identified and treated earlier. The experimental use of physicians and geriatric nurse practitioners to provide medical care in nursing homes on an "as needed" basis, for example, resulted in fewer hospital admissions and lower total costs, when compared with a control group of homes (Mark et al, in press).

Physician House Calls

Many reasons have been given for the decline of the house call in recent years: increasing physician specialization, absence of infectious disease quarantine, the use of sophisticated diagnostic tools available only in the office setting, and more readily available transportation. Given the high price of physicians' services, some have felt housecalls are a nonoptimal use of physicians' time. Yet housecalls may still be an important means for assuring access to medical care for a subgroup of the population: the elderly and disabled. These persons may be physically unable to transport themselves to the physician's office and may lack a friend or relative to drive them. Regular physician visits to the patient's home may help avoid, or at least postpone, costly nursing home admissions.

In recent years, organized home care programs, the provision of medical, nursing, and personal care services through a team approach in the patient's home, have been advocated as a less costly alternative to institutionalization. Empirical studies have shown that patients placed in home care programs have more successful outcomes than those placed in nursing homes, ceteris paribus (Mitchell, 1978). Medicare and Medicaid both provide home health services, but they account for a small proportion of all Medicare and Medicaid expenditures (CBO, 1977). The unavailability of organized home care programs in many communities, furthermore, seriously restricts their use. An additional, but generally ignored, source of home care is the private practice physician.

Relatively little data are available on the frequency of housecalls, and the types of physicians who make them. The few American studies examining housecalls have been conducted with small, non-randomly selected samples. A survey of New Jersey family practitioners found

that house calls were provided by 82 percent of responding physicians (Warburton et al., 1977). The average number of house calls per physician in the most recent week of practice was 6.1. No differences were noted between older and younger physicians.

Most studies show that the majority of housecalls are made to the homebound elderly, a group that otherwise would not have received physician care (Elford et al., 1972; Warburton et al., 1977). Physicians responding to these questionnaire surveys, furthermore, agreed that impediments to mobility (i.e., age and/or disability) are important and valid reasons for making housecalls.

Research is clearly needed to determine the factors influencing a physician's willingness to make housecalls. If physician reluctance to make housecalls is similar to that of making nursing home visits (e.g., both types of visits yield low marginal revenue), then the implications for public policy also may be similar. In particular, adjustment of housecall fees relative to office visit fees may encourage physicians to shift time away from office to home visits. Similarly, current manpower policies to increase the supply of primary care physicians relative to specialists may lead to more housecalls. Increased physician expenditures due to higher priced housecalls may be at least partially offset by reduced nursing home expenditures.

III. CONCEPTUAL MODEL OF PHYSICIAN VISITS

The limited involvement of physicians in nursing homes and patients' homes has been documented in a number of case studies. Explanations for this absence, however, have rested primarily on anecdotal evidence and surveys of physicians' attitudes towards old age. There is no empirical evidence on why physicians do or do not see nursing home patients, or do or do not make house calls. We will develop and test a model of physician time allocation across visit categories, with particular reference to visits to homebound and nursing home patients. Briefly, physicians are hypothesized to choose visit types that maximize income for a specified level of leisure time. Thus, where the marginal revenue yielded by nursing home visits or house calls is low, we would expect less physician involvement with these types of patients. In addition, these settings are hypothesized to constitute a "secondary" market for physician services, characterized by poor working conditions and low prestige. Physicians enter this market only when they are unable to successfully compete in the primary (hospital and office) market. As a result, this secondary market is largely populated by older physicians, general practitioners, and foreign medical graduates, i.e., those physicians with inferior and/or obsolescent technical skills.

Demand for Nursing Home Days

The demand function for physician nursing home visits can be derived from the demand for nursing home days generally, since the physician is a complementary input to the production of nursing home services. A decline in health status and/or social dislocations in an individual's life usually will precede nursing home placement. The entry point, however, is almost always the acute care hospital. For some patients, hospital treatment for illness or injury must be followed by long-term convalescence or rehabilitation. For others, the loss of a caregiver, mental disorientation, inability to negotiate stairways, and many other non-medical problems may precipitate hospitalization as a temporary solution to the person's incapacity to live alone.* Due to physical and psychological disability, the decision to go to a nursing home (and particularly the choice of facility) is often made by an agent: a family member, social worker, or the physician prescribing nursing home care. Both consumers and professionals generally lack knowledge of what constitutes a "good" nursing home, and as a result, there is almost no search activity (Bishop et al., 1977). Choice criteria may include physical proximity to the home of a relative or to the physician's office.

*Medicare regulations encourage this pathway by requiring a minimum three-day hospital stay prior to nursing home placement.

The demand for nursing home days will depend, inter alia, on the gross price of care, insurance coverage, sociodemographic characteristics, health status, and the availability of alternative sources of care. Nursing home utilization rates will be higher where the per diem charges for care are lower, ceteris paribus; Chiswick (1976) found that price had a significant negative effect on the quantity of nursing home services demanded, with an elasticity of -2.3. Empirical research shows that acute hospital care and nursing home care are substitutes (Feldstein, 1971), and hence the cross-price elasticities will be positive. The demand equation for nursing home days thus should include the price, or relative supply, of acute hospital beds.

For the elderly, residing in one's own home with adult children or other relatives also are alternatives to living in a nursing home. Noninstitutional care is more likely to be provided by female than by male relatives. Women with a high productivity in market activities relative to nonmarket activities, however, will substitute nursing home care for their own care. Support for this hypothesis comes from Chiswick (1976) who found that the labor force participation rate of adult married women significantly increased nursing home care (elasticity of 1.4).

The demand for nursing home days is also a function of sociodemographic characteristics of the patient population and their health status. Nonwhites are less likely to be admitted to nursing homes than are whites; only 8.3 percent of all nursing home residents in 1977 were nonwhite (NCHS, 1978). Racial discrimination by nursing home operators is one alleged reason for disproportionate levels of utilization (Moss and Halamandris, 1977). Equally if not more important are socio-cultural differences: a strong sense of family responsibility for aged members, as well as language barriers, especially for older Asian- and Mexican-Americans.

Older persons (65 years and over) are significantly more likely to utilize nursing home services; over 85 percent of all SNF and ICF residents are elderly (NCHS, 1978). This is not surprising, since the chronic handicapping conditions often necessitating nursing home admission accumulate with age. Declining health status also will raise the demand for nursing home days. Holding age constant, more seriously ill persons will be less able to care for themselves and will substitute nursing home for noninstitutional care (Chiswick, 1976).

Higher incomes and health insurance coverage are hypothesized to raise the demand for nursing home days. With the exception of Medicaid, third-party coverage of nursing home services is generally considered to be almost nonexistent. (The extent of health insurance coverage for physician services in nursing homes is much greater than commonly realized, and will be discussed separately under the derived demand function for physician visits.)

Medicare entails so many conditions restricting nursing home eligibility, that it provides financing to a relatively small proportion of patients. Under Part A, only 100 days of skilled nursing home care per benefit period is covered and must be preceded by at least three days of hospitalization. Medicare beneficiaries who exhaust the 100-day limit must turn to personal resources or to Medicaid. Nursing home surveys conducted by the National Center for Health Statistics (1976) have shown that only 1.1 percent of nursing home residents receive Medicare at a given point in time. This is probably an underestimate of Medicare days of care, however, for two reasons. First, NCHS included only residents living in the nursing home at least a month. Second, cross-sectional surveys typically undercount the shorter-stay patient (Kastenbaum and Candy, 1973; Wershow, 1976). Medicare patients do, in fact, appear to have shorter lengths of stay; they account for 12.3 percent of all nursing home discharges (NCHS, 1978).

Medicaid programs will reimburse both skilled and intermediate nursing home care to eligible patients indefinitely. Medicaid is the major third-party payor of nursing home services; nursing homes are reimbursed by Medicaid for almost one-half (47.9%) of all residents (NCHS, 1976).^{*} While Medicaid eligibility requirements vary somewhat from state to state, most programs require that recipients first "spend down" to specified income levels. Nursing home care is the major cause of catastrophic illness expenses for the aged. In 1974, almost one-half of all nursing home patients receiving Medicaid were not initially poor, but had exhausted personal resources in order to qualify as "medically indigent" (CBO, 1977).

There is relatively little penetration of private health insurance in the nursing home care sector. Approximately one-third of the civilian population is estimated to have private health insurance for nursing home care (Carol, 1978). The extent of benefits is unknown, but they are usually included as special extended care options either to Blue Cross-Blue Shield plans or to group policies of commercial insurers.

Because of the Medicare and Medicaid eligibility restrictions discussed above, a large proportion of nursing home residents (37%) receive their primary support from personal or family income (NCHS, 1976). Based on 1967 data, Chiswick (1976) found a significant income elasticity (0.9) of demand for nursing home care. Given the low health insurance penetration in the nursing home care sector relative to other sectors, income may be a more important predictor of nursing home days than insurance coverage, ceteris paribus.

Demand for Physician Nursing Home Visits

We can summarize the demand for nursing home days, as follows:

$$D_{NHD} = (P_{NHD}, P_{HD}, DEM, HEALTH, INS_{NHD}, Y, SUBS)$$

where

D_{NHD} = Quantity of nursing home days demanded;

^{*}Medicaid also accounts for a large proportion of nursing home discharges, 36.2 percent (NCHS, 1978).

P_{NHD} = Price for nursing home day;

P_{HD} = Price for acute hospital day;

DEM = Vector of patient socio-demographic characteristics;

HEALTH = Health status of patient population;

INS_{NHD} = Insurance coverage for nursing home care;

Y = Per capita income of patient population;

SUBS = Availability of substitute sources of care.

The demand function for physician nursing home visits can be derived from the demand for nursing home days generally, as follows:

$$D_{NHV} = f(P_{NH}, P_O, P_H; INS_P; D_{NHD})$$

where D_{NHV} = Quantity of physician visits demanded in the nursing home;

P_{NH} = Price for physician nursing home visit;

P_O = Price for physician office visit;

P_H = Price for physician hospital visit;

INS_P = Insurance coverage of physician nursing home visits.

Patients must decide whether to visit the physician in his office, receive a visit at the nursing home from the physician, or to receive their care in the hospital. Patients will demand more physician visits in the nursing home, when the price for this visit category is low relative to the prices for office and hospital visits.

The extent of health insurance coverage for physician nursing home visits is much greater than commonly realized. Physician services are not included as part of the nursing homes' per diem reimbursement rate; instead physicians bill the patient or third-party payor directly on a fee-for-service basis. Benefit levels and eligibility criteria for nursing home care and for physician services in that nursing home under the same third-party payor are often not identical. Nursing home patients will demand more physician visits, as the net price of care is reduced. Of course, aggregate demand will still be constrained by the coverage of nursing home days generally. Nevertheless, for patients already residing in nursing homes, there may be considerable unrealized demand for physician visits.

Unlike nursing home days of care, reimbursement for physician visits in nursing homes is covered by Medicare Part B and has far fewer restrictions. Medicare will pay for any medically necessary physician visit, regardless of whether the facility is certified under Medicare, regardless of whether or not it is a skilled nursing facility, and regardless of whether or not the patient has exhausted his 100-day limit. Medicare regulations require that skilled nursing facility patients be seen by a physician once every thirty days, plus any additional visits needed for care of acute episodes. This thirty day requirement is a floor, not a ceiling, and was designed to assure a minimum level of care. The nursing home is not expected to ration physician visits. For certified SNF stays, most Part B carriers will allow up to one physician visit a week without additional justification.

Thus, although a Medicare patient may exhaust his SNF benefits, he may continue to receive physician services in the same or in a different nursing home. There are no restrictions on the number of physician visits, except for the utilization review parameters established by the Part B carriers; in theory, they could continue indefinitely. As before, the patient continues to pay the Part B deductible (\$60 every calendar year) and the 20 percent coinsurance on the physician's fees.

Most long-stay nursing home patients will exhaust personal/family financial resources and go on Medicaid. Medicare will continue to reimburse the physician for his services, however, at 80 percent of his reasonable charge. In most states, Medicaid has "bought in" the coinsurance and deductible. Under this arrangement, Medicaid programs will reimburse the physician for that portion of his charge not covered by Medicare. Thus, the physician receives the full Medicare allowed charge, and not the lower Medicaid fee, for his poor elderly patients. In these states, the Part B carrier reimburses the physician directly for both the Medicare and the Medicaid portions of his bill, and thereby reduces his collection costs.*

As under Medicare, Medicaid regulations mandate a physician visit once every 30 days for all SNF patients. Intermediate care facility services are also provided by Medicaid and require that patients be seen once every 60 days. As in other visit categories, however, reimbursement rates for physician nursing home visits under Medicaid are inevitably lower than those of other third-party payors. (Sloan, Mitchell, and Cromwell, 1978).

Unlike private insurance for nursing home days generally, physician visits to skilled nursing facilities are part of the basic benefits package of most major medical plans. Blue Shield, for example, will reimburse physicians in full (i.e., no coinsurance or deductible) for SNF patients, up to one visit per day for an unlimited number of visits. This is identical to the coverage of physicians' services in the hospital, except for the one visit a day ceiling.

*Claims processing difficulties and payment delays are reported to be far greater under Medicaid than Medicare (Sloan, Cromwell, and Mitchell, 1978).

The vast majority of nursing home patients are expected to have some form of health insurance for physician visits, usually Medicare. Although one-third of nursing home residents receive their primary support from personal or family income, an unknown (and probably large) number of these patients will continue to have insurance coverage for physician services. As a result, insurance coverage is expected to be a more important predictor of physician nursing home visits than income, ceteris paribus.

Demand for House Calls

The demand function for house calls is similar to that for physician nursing home visits and only major differences will be noted.

The majority of house calls in this country are provided to elderly persons, whose mobility is restricted by chronic disease (Elford et al., 1977; Warburton et al., 1977). Surprisingly, pediatric cases account for a small proportion of all house calls; physicians apparently assume that transportation can be easily provided by the child's parents.

The availability of substitute sources of care in the community may also influence the demand for house calls somewhat differently than for nursing home visits. Where the labor force participation rate for women is high, for example, the demand for house calls may fall, as nursing home care is substituted for the care of female relatives. Alternatively, demand may increase, as elderly patients remain at home but do not have anyone to drive them to the physician's office. For the disabled and elderly, nursing home care is clearly a substitute for self-care, and the demand for house calls will be low in areas of high relative supply of nursing home beds.

Under Medicare, house calls are reimbursed just like any other type of physician visits. There are no restrictions on the number of house calls a Medicare beneficiary may receive. Medicaid also covers house calls, but again reimbursement levels will be low relative to those of Medicare. There may also be strict limits on the number of calls per patient. Like most ambulatory medical care, there is little coverage of house calls by private health insurance plans. As a result, income is hypothesized to be a more important determinant of house calls than insurance coverage.

Due to their limited mobility, chronically ill and elderly patients in rural areas will have particular difficulty in travelling to the physician's office for care. As a result, they will be willing to pay more for a house call.

The demand for house calls can be summarized, as follows:

$$D_{HC} = (P_{HC}, P_O, P_H; DEM; HEALTH; INS_{HC}; Y; SUBS; DENS)$$

where D_{HC} = Quantity of house calls demanded;

P_{HC} = Price for physician house call;

P_O = Price for physician office visits;

P_H = Price for physician hospital visit;

DEM = Sociodemographic characteristics of county population;

HEALTH = Health status;

INS_{HC} = Insurance coverage for house calls;

Y = Per capita income;

SUBS = Availability of alternative sources
of care;

DENS = Population density.

Physician Supply of Nursing Home Visits

Nursing home visits and house calls compete with office and hospital visits for physician time. Where the physician allocates his scarce time will depend on the relative costs and relative prices of different types of visits. In making this joint allocation decision, the physician is generally assumed to maximize utility, subject to production and time constraints. Utility is a positive function of income and leisure. In order to maximize utility, the physician must decide how many total hours to work and how to allocate his time over different types of visits (e.g., office, nursing home, hospital, house calls).

The decision rule requires that the physician allocate his time so that net marginal revenue products are equal across all visit categories. Net marginal revenue products to physician time will be higher or lower depending on physician marginal productivity, fees, and marginal costs. Where productivity and/or fees are high, physicians should allocate more time, while less time should be spent in settings with higher marginal costs. Each visit type has a unique production function. They take different amounts of physician time to perform and use varying proportions of capital and nonphysician labor inputs. Physician fees also vary across the visit categories.

The physician's office productivity is relatively high; once he arrives in the office, he sees a steady stream of patients. Off-setting this may be high costs for auxiliary personnel: clerical and nursing staff are used to assist the physician in his treatment of patients, for appointments and scheduling, receptionist, medical records, and billing and collection. No automobile costs are incurred.

The physician's productivity is clearly very low in the house call category, on the other hand. He must incur constant travel costs between each visit, and automobile costs will be especially high.

Only minimal clerical costs are incurred, however, primarily record-keeping and billing for the house calls.

Physician productivity in making nursing home and hospital visits, is somewhat similar. Both categories have periods of "down" time, as the physician must travel from one institution to another. Positive automobile costs are incurred, and may be higher for nursing home visits if the physician must travel to more homes to see a fixed number of patients. The physician can achieve considerable economies of scale by admitting multiple patients to the same hospital and thus minimizing his travel costs. He may not be able to achieve these same economies in the nursing home, however, for two reasons. First, a physician will have fewer patients requiring nursing home services relative to hospital services. He also does not need to return as frequently to visit the same patient, as he does with more seriously ill hospital patients. Second, nursing homes tend to be much smaller than hospitals thus limiting the potential pool of patients in any one home. By influencing the choice of nursing home, however, the physician could increase the number of patients in a given facility. The physician might minimize travel costs, for example, by placing all of his nursing home patients within one or two facilities close to his office or hospital. Conveniently located nursing homes may not always be available, however. Some nursing homes do not accept Medicaid patients; those that do usually maintain waiting lists for admission. Also many nursing homes are limited in the level of care that they are both able and willing to provide to patients.

The use of nonphysician labor from the physician's practice is limited to record-keeping and billing for hospital and nursing home visits. In addition, the physician may substitute house staff and nursing personnel in these facilities for his own time. Hospitals are largely non-profit institutions, however, while the majority of nursing homes are proprietary. This structural difference between the two industries undoubtedly alters the physician's ability to use inputs within the two settings. The physician has de facto control of the hospital and uses facilities and staff as complementary inputs in his own production of medical services (Pauly and Redisch, 1973). Because of the fixed travel costs involved, the physician with a small number of hospital patients in particular will face a strong incentive to substitute hospital personnel for his own time. Since he is not taxed on his use of these inputs, hospitalization will yield high net marginal revenue.

Physician ability to use similar inputs may be constrained, however, within the "for-profit" nursing home. Facility operators will choose a mix of nursing home inputs and a level of nursing home quality that will yield lower costs per admission than physicians' preferred service levels. Given the small number of patients treated by any one physician, there is little financial incentive for individual physicians to try and change this. This low concentration of output across attending physicians in nursing homes also should greatly enhance the operators' power to control resource use (Pauly, 1978).

Reimbursement levels also vary considerably for the different types of visits. Table III-1 presents Medicare prevailing charges for general practitioners and internists across five types of visits: single patient visit and multiple patient visit ("gang visit") at a nursing home,

TABLE III-1:

a

REIMBURSEMENT RATES AND TIME SPENT ACROSS VISIT CATEGORIES

Visit Category	GP	Internist	Minutes/Patient
Nursing Home Multiple Patients Single Patient	\$11.10 \$15.42	\$13.95 \$17.93	36 ^b
Office	\$10.51	\$13.67	20
Hospital	\$12.45	\$15.28	28
House Call	\$16.93	\$19.61	72 ^b

Sources: Personal Communications, Medicare Part B carriers, 1978;
NORC Physician Survey, 1976.

^a All fees have been adjusted for geographic cost-of-living differences, and are expressed in 1977 dollars.

^b Includes travel time.

routine office visit, routine hospital visit, and house call. These prevailings are national means for fee screen year 1978. Also in Table III-1, is the mean time (in minutes) spent per patient in each visit category, based on our national physician sample. Absolute levels for nursing home visit (and housecall) prices are certainly competitive with those for other visit types. These higher fees are offset, however, by lower physician productivity in making nursing home visits and house calls. Physicians will consider both of these factors (along with the relative costs of different types of visits) in determining the best use of their time.

In making this joint allocation decision, however, physicians may not be setting pure net marginal revenue products equal across visit hours. The unwillingness of physicians to make nursing home visits is so marked that additional explanation of the physician's behavior is required. Anecdotal evidence suggests that nursing home patients are viewed as unrewarding, professionally as well as financially. Nursing home patients are allegedly more depressing and less interesting than hospital patients; the physician is unable to cure them and is constantly reminded of his own mortality. In Senate testimony, physicians have repeatedly stated that they "hate to go to a nursing home", complaining of dirty facilities and disoriented patients (U.S. Senate Special Committee on Aging, 1975). Such evidence of aversion suggests that neoclassical theory is limited in explaining physician nursing home behavior.

One possible alternative explanation is that elderly patients are simply not professionally challenging; Feldstein (1970) has suggested for example, that physicians' price and output decisions are motivated in part by a desire to choose "interesting" cases. In order to obtain such cases, the physician sets prices so that there is excess demand for his services. This enables him to pick and choose the patients he wants to treat. Feldstein's evidence in support of this excess demand hypothesis has been rejected by a number of economists on the grounds that his equations were underidentified (Newhouse and Phelps, 1976; Sloan and Feldman, 1977). Since physicians do treat geriatric patients in other settings (i.e., in hospitals and their offices), furthermore, this casemix preference explanation is not a particularly compelling one. Instead, we must attribute the absence of physicians from nursing homes to other factors.

The Nursing Home as a Secondary Labor Market

Physician preferences have dichotomized the market for physician services; these two markets are perceived very differently, one primary, the other secondary, reimbursement levels aside. The primary market has many of the characteristics of a primary market in dual labor market theory: high "wages", good working conditions, and opportunities for professional advancement (Gordon, 1972; Piore, 1971). Similarly, the secondary market for physicians' services shares many characteristics with the secondary market in dual market theory: low "wages", poor working conditions, and few chances for advancement. The nursing home setting is clearly secondary in terms of physician preferences and physicians enter this market only when forced to do so by competition. As a result, physicians in the nursing home market have fewer credentials on average; they tend to be physicians without advanced training

(general practitioners), physicians with allegedly inferior medical ability (foreign medical graduates), and physicians whose technical skills are obsolescing (older physicians). Better trained physicians will face greater demand for their services and can choose to practice solely in the primary (office and hospital) market.

In analyzing the secondary characteristics of the nursing home market, comparisons will be drawn largely with the hospital setting. On the surface, nursing homes would appear to function much like hospitals, and these similarities make the dual market structure particularly intriguing. Both nursing homes and hospitals are health care institutions that produce a mix of nursing, ancillary, and support services. In both facilities, medical care is provided by independent physicians who bill patients directly for their services. Health insurance coverage for these services is also much greater than for ambulatory medical care. The services of both institutions may be used as joint inputs in the production of improved health outcomes, as patients are transferred from hospital to nursing home for convalescence or rehabilitation. This complementary relationship is recognized explicitly by third-party payors, such as Medicare which requires a minimum hospital stay prior to admission to a skilled nursing facility. Furthermore, the physician responsible for ordering a nursing home placement often is the physician who admitted the patient to the hospital initially and who treated him there.

Although third-party reimbursement levels for nursing home visits are actually higher than for hospital visits, the higher travel costs associated with nursing home visits will effectively lower the physician's net marginal revenue for such visits. Physicians may be unable to achieve the economies of scale in nursing homes, or to utilize their labor inputs, as they can within the hospital setting. Attempts to achieve scale economies with nursing home visits are actually penalized by the major third-party payors. Concern over physician fraud and abuse has led to a two-tiered method of payment that applies only to nursing home visits: one rate if only a single patient is treated; and a second rate when two or more patients are seen in the same home. These latter "gang visit" rates are 30-40 percent lower on average (see Table III-1 above).

Working conditions, such as available technology and environmental quality, are clearly different in the two markets. Younger physicians increasingly view medicine as a "science" rather than an "art" (Colombotos, 1971), an attitude that clearly is reflected in the growing trend towards specialization. Acute care within the hospital setting permits the physician to learn and to apply the latest in medical technology. The knowledge and use of these advanced techniques define the specialist; without them, he can not distinguish himself from any other physician (Stevens, 1971). Physicians appear to be more than willing to treat depressing cases (e.g., terminally ill cancer patients) if they can employ specialized diagnostic and therapeutic tools. Once that same patient leaves the acute care setting for placement in a nursing home, however, all physician interest appears to vanish. Chronically ill patients in a nursing home require less intensive physician input, and hence do not provide an opportunity to use sophisticated facilities and

equipment. While fewer physician services are needed in a nursing home compared to the hospital, current levels of physician input do not even meet the minimal medical requirements, as established by Medicare-Medicaid regulations.

The nursing home environment has been characterized as unpleasant, compared with the hospital; physicians complain, for example, of dirty facilities and inadequate assistance from nursing staff (U.S. Senate Special Committee on Aging, 1975). Many of these complaints are undoubtedly legitimate. But why don't physicians work to improve such conditions, as they have in the hospital? The physician has traditionally played a key role in the development and maintenance of hospital standards. Since physicians control access to hospital beds, community hospitals must compete for patients indirectly by inducing physicians to join their medical staff. The hospital that does not maintain a minimum level of quality will face a loss in revenues, as physicians decide to admit their patients elsewhere. Maintaining quality is defined as the availability of up-to-date medical technology and adequate support personnel, particularly house staff (interns and residents) and nurses. At the same time, the physician will seek to gain admitting privileges to the "better" (higher quality) hospitals because such affiliations give him prestige.

The physician also has considerable control of the nursing home de jure; only he can admit patients, prescribe medications, order necessary laboratory tests, sign death certificates, etc. Presumably, he could use this control to influence working conditions and the quality of care here as well. There are probably several reasons for his failure to do so. Because of the absence of specialized medical technology, affiliations with nursing homes (even the "better" ones) do not lend the physician prestige in the community. Physician participation in nursing homes may even be a negative good, actually lowering his prestige. In addition, excess demand for public nursing home beds may make nursing home operators less responsive to physician control. Facility administrators need not please physicians in order to maintain high occupancy rates. Finally, given a relatively low nursing home caseload, the financial incentive for the physician to improve conditions is quite small.

The physician's chances for professional advancement may be seriously restricted in the nursing home market, for several reasons. First, his lack of exposure to technology in the nursing home setting will limit his ability to move into the primary market. Second, this physician has no opportunity to gain a professional reputation because he is largely unobserved by his peers. Like all physicians, however, his career is almost totally dependent on referrals from other physicians. Within the hospital setting, on the other hand, the physician interacts with colleagues, has a chance to demonstrate technical skills, and can accrue prestige within the medical community. In short, the hospital provides both the technology and the professional contacts necessary for advancement in the primary market.

In sum, the nursing home setting can be viewed as a secondary market for physician services, characterized by "low pay", poor working conditions, and low prestige. Physicians entering this secondary market

are hypothesized to be disproportionately older, graduates of foreign medical schools, and without specialty training, i.e., those physicians less able to compete in the primary hospital and office market. The factors influencing entry into the secondary market are reviewed in more detail below.

Specialty and Other Credentials

Physicians with greater amounts of professional training will seek to work in settings where they can exercise their specialized skills. Because such skills are associated with higher quality, these physicians will face greater demand for their services and will be able to practice in the setting of their choice. They also will be able to command higher fees and thus will have less incentive to see low marginal revenue patients. Physicians without specialized skills and training, i.e. general practitioners, will be forced into the less prestigious and less lucrative nursing home market. Thus specialists and board-certified physicians are hypothesized to make fewer nursing home visits.

Similarly, foreign medical graduates (FMGs), particularly those from Third World countries, are popularly believed to have received relatively poor training. While empirical evidence that FMGs provide inferior care has been questioned (Tan, 1977), they nevertheless are perceived as such. The prevalence of FMGs in mental and state hospitals, settings that share many characteristics with the nursing homes of a secondary market for physician services, reinforce this view. FMGs are hypothesized to see more patients in nursing homes than their U.S. counterparts.

Physician Age

The older physician is likely to face a drop in demand for his services. Referring physicians may decline to send him new patients, preferring to recommend the services of a younger physician more fully acquainted with the latest medical techniques. The older physician may also find that his own patients are "retiring" him (Freidson, 1970). In short, he has become technologically obsolete. A dwindling practice load and a fall-off in referrals will combine to push the aging physician into the less attractive nursing home market. Reduced demand for the services of the older physician has some empirical support; Sloan and Lorant (1976) found that physicians over age 55 offset this drop in demand with increases in the average length-of-visit. (Longer visits were assumed to be associated with higher fees.)

Some descriptive studies have argued that older physicians are apt to identify with their elderly patients; questionnaire data have suggested, for example, that older physicians have more positive attitudes toward geriatric patients and are more likely to treat them in nursing homes (Miller et al., 1976). This may also be a specialty effect, as older physicians are more likely to be general practitioners which in turn predisposes them to see nursing home patients.

An alternative explanation for the supply behavior of older physicians would predict a negative impact of age on nursing home visits. If older physicians wish to reduce their workload, they may drop low marginal revenue patients first. Older physicians would then see fewer nursing home patients, rather than more. The net impact of age on the absolute number of nursing home patients seen thus can not be determined a priori. Older physicians are hypothesized to make a greater proportion of nursing home visits relative to office and hospital visits, however, as they reduce their work effort but at the same time are forced into the less lucrative nursing home market.

Practice Costs

A potentially large component of physician costs in providing nursing home visits is travel time. Communities with a greater supply of facilities should encourage physician visits, as distances are shortened from office to nursing home. Similarly, when the ratio of nursing homes to total physicians is high, physicians will be more willing to see nursing home patients. With more nursing homes to choose from and to visit, the physician can lower travel costs by selectively placing patients in the most convenient facilities.

Similarly, physicians with a high time price are hypothesized to see few nursing home patients. Assuming these visits yield comparatively low marginal revenue, the physician will reduce his output by reducing his nursing home caseload first. Physicians with substantial nonpractice income and female physicians with children should value their leisure time more highly and thus will prefer a predominantly office-based practice. Past research by Sloan (1975) indicates that female physicians with children work fewer hours, and the number of children has no impact on the work patterns of male physicians.

Unlike his office practice, the physician utilizes very little nonphysician labor in his production of nursing home visits. Only a small number of auxillary personnel hours are required for routine record-keeping and billing purposes. When wage rates for those inputs rise, office practice costs increase, thus encouraging physician movement into the less costly nursing home market.

Availability of Substitutes

The relative supply of nursing home and acute hospital beds also will influence the physician's time allocation across visit categories. Evidence on Medicare beneficiaries has shown that extended care facility (ECF) admissions per hospital admission varied positively with the supply of ECF beds and negatively with short-term general hospital beds (Feldstein, 1971). Physicians are expected to make more nursing home visits in communities with a higher ratio of nursing home beds to acute hospital beds because of substitution.

Medicaid Participation

A large part of physician unwillingness to treat nursing home patients may in fact be the result of physician nonparticipation in state Medicaid programs, due to low Medicaid fee schedules and excessive administrative requirements.* The pool of available physicians for nursing home would thus be reduced by the extent of Medicaid nonparticipation.

If physicians decide to participate in Medicaid because the pool of Medicaid eligibles in nursing homes is large, then the Medicaid participation decision will be endogenous to our model of nursing home visits. Nursing home visits constitute such a small proportion of total visits on average, however, that such behavior is not likely. Since the majority of nursing home patients remain eligible for Medicare reimbursement of physician services, furthermore, the effect of physician nonparticipation may not be nearly as great as it initially might appear. In any case, Medicaid participation is not expected to influence the relative distribution of nursing home visits and other types of visits. There is no reason to assume that physicians will substitute Medicaid nursing home visits for Medicaid office visits, for example. The technological preferences biasing physicians against nursing home visits will be similar for both Medicaid participants and nonparticipants. Physicians will expand their Medicaid office practices, before entering the secondary nursing home market.

Physician-Population Ratio

Economists are divided over the physician's response to increased competition. Traditional economic theory predicts that the physician-population ratio will be positively related to per physician nursing home visit rates. As the supply of physicians increases, workloads fall (and so do incomes). A constant demand for office visits is spread across more physicians, lowering the marginal revenue product to office visits, and thus encouraging movement into the nursing home market. This response assumes, however, that physicians are willing to work harder for the same income and that they are willing to enter a secondary market in order to do so.

If physicians are able to induce demand for their services, on the other hand, then the correlation between the physician-population variable and total visits will be zero or even negative. By exercising their power to shift demand, physicians could increase their office visit workloads and return to a target income. Proponents of the target income hypothesis such as Evans (1974) argue as follows: The physician's unique role as a consumer agent allows him both to define the patient's medical care needs and to provide the services to satisfy those needs. Market equilibrium can be obtained not only by adjustments in price, but also by influencing the consumer's perceptions of need. As a result,

*See Sloan, Mitchell, and Cromwell (1978) for an extensive discussion of this issue.

the physician enjoys considerable discretionary influence over the mix of services he provides. Faced with a declining workload, the physician may choose to bring a patient back for follow-up, for example, when previously a single office visit sufficed. The physician's ability to induce demand will attenuate movement into the nursing home market, by protecting physician income in the primary office market.

Empirical evidence suggests that physicians may be able to shift demand,* but econometric problems leave the issue still clouded and subject to debate. (See Sloan and Feldman (1977) for a comprehensive review and critique of work in this area.) A non-positive correlation between the physician-population ratio and visits could also be explained, however, by a rise in "quality-amenities", such as longer office visits spent with the physician. Empirical support comes from Sloan and Lorant (1976) who found a significant positive impact of physician-population ratios on the average length of office visit. As patients are presumed willing to pay for quality, physicians can offset falling incomes with increased lengths-of-visit in the office. Although workloads still decline, total hours do not and no additional time will be freed up for nursing home visits. To the extent that physicians are able to do this, they can avoid moving into the less attractive nursing home market. Physicians' aversion for nursing home visits will simply reinforce any demand-shift effect.

Physician Hours of Work

The number of nursing home visits a physician makes will obviously depend in part upon his total work effort. We would expect, for example, that physicians with shorter work weeks would see few nursing home patients, *ceteris paribus*. If the physician supply curve is backward bending, a rise in average reimbursement levels may lead to a reduction in total hours worked, including hours spent in nursing homes. According to this hypothesis, once the physician achieves a certain earnings level, he will choose an extra hour of leisure over an extra hour of work (the income effect), when fees increase. Unlike other workers, the self-employed physician does not face a fixed wage. Instead, the physician's wage will depend in large part upon his own work effort, and his hourly wages are expected to fall as the number of hours worked increases for the following reason.** The physician is the principal input to his practice and usually works alone or in a small group. His marginal product thus is determined primarily by his own hours-worked decision and will decline as total hours increase, due to fatigue, appointment scheduling difficulties, etc. The supply curve will be backward-bending under these conditions, because at higher prices, physicians may choose to supply fewer rather than more services, as a function of certain income-leisure preferences.

*E.g. Evans (1974), Feldstein (1970), Fuchs (1978), and May (1975).

**See Sloan (1974) for a detailed theoretical discussion of this topic.

If physician fees are increased across the board, a backward-bending supply curve will restrict the access of all patients to physician services, but nursing home patients may be particularly affected. First, if physicians reduce their time input uniformly across visit categories, the impact will be disproportionately greater for infrequently performed types of activities, such as nursing home visits. Second, if nursing home visits are a secondary market, absorbing physician time at the margin, and if physicians can earn high incomes through office and hospital visits, physician hours in nursing homes will be cut back first. In many instances, this may mean a reduction in physician nursing home visits to zero.

Policy-makers might increase the nursing home visit fee alone in order to encourage physician participation in this market. The proportion of nursing home visits relative to hospital and office visits will probably increase, as physicians shift their time to the higher paying visit category. Access to physician services in nursing homes may remain unchanged or even fall, however, if physicians can maintain previous income levels with a reduced number of all visit types.

Whether the income effect dominates the substitution effect and if so, the wage level at which it occurs, and the magnitude of physician response, are still the subjects of intense investigation. Feldstein (1970) found negative price elasticities of supply based on time series data for the U.S. as a whole and concluded that the physician supply curve was backward-bending. The price elasticities varied considerably however (from -0.28 to -1.91), depending upon the specification of the regression equation. Based on 1960 and 1970 census data, Sloan (1975) analyzed the hours worked and weeks worked decision and found only weak support for the backward-bending supply curve hypothesis. The response of both weeks and hours worked to the wage variables was small and insignificant at plausible wage levels. Vahovich (1977) estimated supply equations for both a pooled sample of physicians and for individual specialties. He found significant evidence of backward-bending supply curves for hours worked by general practitioners, surgeons, and internists. Wage elasticities were generally low but still positive (0.22) when evaluated at the mean for the pooled sample and turning negative when evaluated at one standard deviation above the mean (-0.55).

Other variables, such as physician and practice characteristics, were found to influence the hours worked decision and were initially included in this analysis. Physicians with a high value on their non market time, i.e. physicians with substantial non-practice income and female physicians with children, work significantly fewer hours per week. A drop in demand and failing health combine to shorten the work week of older physicians (60 years of age and over). Physicians in areas of low physician-population ratios work longer hours, presumably because of more frequent night and weekend responsibilities.

Practice characteristics, such as mode of payment and revenue-sharing arrangements, also influence work effort. Salaried physicians face no incentive to supply additional hours and consequently work

significantly less than their fee-for-service counterparts. Physicians in group practices that share net income also have no incentive to increase their work effort at the margin, as income derived from that effort is shared with their partners. Empirical evidence on the impact of revenue-sharing arrangements on supply have been inconsistent, but the theory of incentives on physician performance is sufficiently strong to warrant inclusion of an income-sharing variable. (See Sloan, Cromwell, and Mitchell, 1978, Chapter 3.)

Summary

Physician supply of nursing home visits can be summarized as follows:

$$S_{NHV} = (P_{NH}, P_O, P_H; MDCRED; MDAGE; COSTS; SUBS; MDPOP; PRAC)$$

where

- S_{NHV} = Number of nursing home visits supplied;
- P_{NH} = Price for nursing home visit;
- P_O = Price for office visit;
- P_H = Price for hospital visit;
- $MDCRED$ = Vector of physician credentials, including specialty and FMG status;
- $MDAGE$ = Physician age;
- $COSTS$ = Practice costs, including physician time and nonphysician labor wage rates;
- $SUBS$ = Availability of substitute sources of care;
- $MDPOP$ = Physician - population ratio;
- $PRAC$ = Vector of practice characteristics influencing work effort.

Supply of House Calls

The model of physician supply of house calls is similar to that of nursing home visit supply, and only differences between them are discussed below. Geographic variations in hospital admission rates and lengths of stay suggest differences in medical style. In more rural states, physicians admit and/or readmit patients frequently for short stays (Gornick, 1975). This style of practice presumably facilitates care by minimizing physician travel costs to patients on an ambulatory basis. Thus, physicians should be more willing to make house calls in areas of high population density. Similarly, since nursing home care may at times substitute for physician services, physicians

are hypothesized to make fewer house calls where the ratio of nursing home beds per capita is high.

Finally, physicians will be averse to travelling in communities perceived as dangerous. House call rates are thus expected to be lower in predominantly nonwhite counties.

The supply function for house calls can be summarized as follows:

$$S_{HC} = (P_{HC}, P_O, P_H; MDCRED; MDAGE; COSTS; SUBS; MDPOP; PRAC; RACE)$$

where

S_{HC} = Number of house calls supplied;

P_{HC} = Price of house call;

P_O = Price of office visit;

P_H = Price of hospital visit;

MDCRED = Vector of physician credentials, including specialty and FMG status;

MDAGE = Physician age;

COSTS = Practice costs, including physician time and non-physician wage rates;

SUBS = Availability of substitute sources of care;

MDPOP = Physician-population ratio;

PRAC = Vector of practice characteristics influencing work effort;

RACE = Percentage of country population nonwhite.

IV. DATA SOURCES

Physician Survey

The primary data base for this analysis is the 1976 physician survey conducted by the National Opinion Research Center (NORC) for the Health Care Financing Administration (HCFA).^{*} This survey was a nationally representative sample of 3482 physicians in fifteen specialties. These specialties included: allergy, cardiology, dermatology, gastroenterology, general/family practice, general surgery, internal medicine, neurological surgery, obstetrics-gynecology, ophthalmology, orthopedic surgery, otolaryngology, pediatrics, psychiatry, and urology. The findings reported here are based on a subset of these specialties, as described below. All physicians were in private practice, and the vast majority were office based (95.8%). Group practices with ten or more physicians were excluded.

A stratified-element (non-clustered) sampling procedure was used in which the strata were defined by specialty, geographic region, and county group size. In order to ensure that there would be sufficient cases for some analyses, certain strata were oversampled. Allergists, for example, were sampled at a higher rate than the more prevalent internists. In order to adjust for this disproportionate allocation, "weights" have been used in all analyses reported here. These weights serve to inflate the sample physicians to the larger physician population from which they were drawn. As the degrees of freedom for significance testing would also be inflated, the weights have been "normalized" by a constant n/N where n is the actual number of sample observations and N represents the population estimates obtained with the weights.

An extensive questionnaire was administered to all physicians, usually by telephone. This questionnaire included data on practice costs, work effort, size and type of practice, physician income, and fees. All information was based on physician self-reports. Questions on work effort and caseload referred to the previous week (seven days) of practice.

Measurement Error

Measurement error may be present if physicians refused to participate in the survey, or if they reported inaccurate or incomplete information during the interview.^{**} If non-respondents differ from survey physicians in ways that are correlated with differences in secondary market behavior, then estimates of nursing home visits and house calls may be biased. There is no reason to believe that any significant non-response bias has been introduced to this study. Analysis of the 1975 physician

^{*}Data collection actually took place in 1977; cost and income data refer to the previous calendar year, hence its designation as a 1976 survey. All other data, such as fees and visits, refer to the actual year in which they were obtained (1977).

^{**}These types of errors are known as non-response bias and field bias, respectively. For a discussion of all types of measurement error and for a more detailed analysis of potential sources of bias in the 1975 physician survey, see Sloan, Cromwell, and Mitchell (1978, pp. 14-21).

survey, for example, found that non-respondent physicians did not differ from cooperating physicians along characteristics believed to be associated with secondary market behavior, such as specialty, board-certification, and FMG status (Sloan, Cromwell, and Mitchell, 1978). In any case, the weights associated with the 1976 sample include adjustments for nonresponse.

Another source of potential error is the extent of under- or overreporting by physicians who did take part in the survey. One area of particular concern is physician caseload and work effort. In order to assess the accuracy of survey responses, AMA mailed questionnaire data on physician visits and hours of work were used for comparison (AMA, 1979). The internists in our study reported a mean 49 hours spent per week in direct patient care, identical to that reported to the AMA by its survey internists. AMA study general practitioners stated they worked 47 hours, however, considerably less than the 52 hours reported by NORC general practitioners. At least part of this difference can be attributed to the fact that more of NORC respondents were located in rural areas, where physicians traditionally have worked longer hours. AMA data are not available for nursing home visits and house calls, but we can compare office visits. General practitioners and internists in our study reported means of 136 and 78 office visits per week, respectively. This compares extremely favorably with 130 and 73 visits reported to the AMA for the same two specialties. Thus, it does not appear that any substantial field bias exists in these physician self-reports. Nevertheless, algorithms relating hours to number of visits by visit category were developed to identify out-of-range values on the dependent variables. These outliers were then dropped from the analysis.

Secondary Data Sources

Four additional data sources were merged with the physician survey for this analysis. Biographic information on individual survey physicians was obtained from the AMA Masterfile, including such data as physician age, board-certification, and medical school. Variables describing the physician's county, such as demographic characteristics, were drawn from the Area Resource File. Two community variables, per capita income and physician-population ratios, were obtained from a more up-to-date source: the AMA's Physician Distribution and Medical Licensure in the U.S., 1976.

Self-reported physician fee data from the NORC survey were not used in this analysis. Instead relative reimbursement rates were proxied by independently obtained Medicare prevailing charges. Prevailing charges for office visits, hospital visits, and house calls were obtained from the 1977 and 1978 Medicare Directories of Prevailing Charges. The Medicare Directory annually publishes prevailing charges for 50 different medical procedures (including visits) for each of the reasonable charge localities in the U.S. These charges are listed both for general practitioners and for specialists, except where the Medicare Part B carrier makes no specialty differentiation in its fee screens.

Prior to 1979, the Medicare Directories do not include prevailing charges for physician nursing home visits. These data were obtained directly from the Part B carriers under the Freedom of Information Act.

Sample Description

The specialty composition of the sample used in the nursing home visit equations was limited to cardiologists, general practitioners, and internists, with an unweighted sample size of 832. Prior examination of the data showed that very few of the physicians in the remaining specialties had made any nursing home visits. Similarly, only general practitioners and internists are included in the house call equations (with an unweighted sample size of 732).*

*As expected, based on the literature, very few pediatricians (9.6%) had made house calls.

V ANALYSIS OF PHYSICIAN NURSING HOME VISITS

Analysis consisted of two components: (1) descriptive statistics, illustrating variations in nursing home visit and house call rates as a function of physician characteristics; and (2) econometric analysis of these variations. Findings are presented first for physician nursing home visits and then for house calls in Chapter VI.

Descriptive Analysis of Nursing Home Visits

Physicians were divided into three groups for comparison purposes: (1) those who made no nursing home visits during the past week; (2) those who saw only a few nursing patients (four or less); and (3) those with five or more visits. Over one-half of sample physicians (53%) saw no nursing home patients. The remaining physicians devoted eight percent of their practice to nursing home patients, averaging 10.8 visits per week.

Characteristics of those physicians making nursing home visits are generally consistent with what we would expect to observe in a secondary market. (See Table V-1.) Physicians seeing at least one nursing home patient appear to have fewer credentials on average than those making no nursing home visits. Only a small number of cardiologists (26%), the most highly trained specialty group included here, reported that they had made any nursing home visits during the previous week. By contrast, almost one-half of general practitioners and internists had seen nursing home patients. Physicians in the nursing home market also appear to be older and foreign medical school graduates. Graduates of Third World medical schools are 50 percent more likely to make nursing home visits (63%) than are those from U.S. or Western European/ English speaking schools (46%). Physicians aged 60 years and over also supply more nursing home visits than do younger physicians. Surprisingly, there appears to be no real difference in the willingness of board-certified and non-board-certified physicians to enter the nursing home market.

Competition is hypothesized to encourage more physicians to see nursing home patients; if so, we would expect a higher proportion of physicians in urban areas to make at least one nursing home visit. In fact, as seen in Table V-2, physicians in non-metropolitan areas are more likely to see nursing home patients than are physicians in either large (greater than 1.4 million) or small cities. The willingness of physicians to make nursing home visits also appears to vary by geographic region of the country. Almost two-thirds of physicians located in the North East census area do not make any nursing home visits, compared with approximately one-half of physicians in other parts of the country. This undoubtedly reflects variations in demand, nursing home and hospital bed supply, etc. Econometric analysis presented in the following section will allow us to examine this more closely.

TABLE V-1:

CHARACTERISTICS OF PHYSICIANS
MAKING NURSING HOME VISITS
(percentage distribution)

	Visits per Week			
	None (53.2%)	1 - 4 (21.7%)	5+ (25.7%)	Total
<u>Specialty</u>				
Cardiology	7.0/73.8	2.7/11.6	2.9/14.5	/100%
General Practice	63.0/52.5	66.7/22.7	63.2/24.8	/100%
Internal Medicine	30.0/51.4	30.6/21.3	33.9/27.3	/100%
Total	100%/	100%/	100%/	
<u>Board-Certified</u>				
Yes	24.5/51.8	32.5/28.1	20.2/20.1	/100%
No	73.5/53.7	67.5/19.6	79.8/26.7	/100%
Total	100%/	100%/	100%/	
<u>Medical School</u>				
Third World	5.4/37.3	7.8/22.3	12.3/40.4	/100%
U.S./Other	94.6/54.5	92.2/21.7	87.7/23.8	/100%
Total	100%/	100%/	100%/	
<u>Age</u>				
60 years +	32.1/47.1	28.5/17.1	51.8/35.8	/100%
Under 60	67.9/56.7	71.5/24.4	48.2/19.0	/100%
Total	100%/	100%/	100%/	

TABLE V-2:

GEOGRAPHIC LOCATION OF PHYSICIANS
MAKING NURSING HOME VISITS
(percentage distribution)

	Visits per Week			
	None (53.2%)	1 - 4 (21.7%)	5 + (25.7%)	Total
<u>Practice Location</u>				
Large Metropolitan	43.7/57.5	35.6/19.1	37.5/23.4	/100%
Small Metropolitan	37.1/55.1	38.4/23.1	30.6/17.8	/100%
Non-Metropolitan	19.2/42.8	26.0/23.7	31.9/33.5	/100%
Total	100%/	100%/	100%/	
<u>Region</u>				
North East	31.7/61.7	26.0/20.6	19.3/17.7	/100%
North Central	20.0/45.9	28.9/27.1	24.9/27.0	/100%
South	27.6/53.3	26.3/20.7	28.5/26.0	/100%
West	20.7/50.3	18.9/18.6	27.2/31.1	/100%
Total	100%/	100%/	100%/	

Econometric Analysis of Nursing Home Visits: Empirical Specification

A reduced form equation for physician time allocation to nursing home visits can be derived from the supply and demand functions described in Chapter III and is specified as follows:

$$\text{NHRATIO} = f(P; \text{DEM}; \text{HEALTH}; \text{INS}; Y; \text{SUBS}; \text{MDCRED}; \text{MDAGE}; \text{COSTS}; \text{MDPOP}; \text{PRAC})$$

where

NHRATIO = Ratio of nursing home visits to other visits;

P = Physician fee ratio (nursing home visit to office visit);

DEM = Sociodemographic characteristics of county population;

HEALTH = Health status of county population;

INS = Health insurance coverage;

Y = Per capita income;

SUBS = Availability of substitute sources of care;

MDCRED = Vector of variables representing physician's credentials;

MDAGE = Physician age;

COSTS = Vector of physician practice costs;

MDPOP = Physician-population ratio;

PRAC = Characteristics of the physician's practice.

All monetary variables are adjusted for cost of living differences and expressed in 1977 dollars.

Dependent Variables

The dependent variable is the proportion of visits spent in nursing homes during the reference week, defined as the ratio of nursing home visits to all other visit categories, i.e., office visits, hospital visits, house, calls, emergency room and clinic visits, and number of operations and assists. For policy purposes, it is useful to further dichotomize the physician's time allocation decision: (1) whether a physician provides any nursing home visits (yes/no); and (2) the proportion of visits made to nursing homes only for physicians making at least one visit.

Independent Variables: Price

The impact of relative prices on the physician's time allocation decision is measured by the ratio of the fee for a nursing home visit to the fee for a routine office visit (NHFEE-R). The fee ratio is constructed from Medicare prevailing charges and thus represents

exogenous reimbursement levels faced by the physician. Physicians are hypothesized to devote a larger share of their practice to nursing home patients when nursing home visit fees are high relative to office fees. A negative coefficient for the fee ratio, on the other hand, might be explained by a backward-bending physician supply curve. With increases in reimbursement rates for nursing home visits, physicians may reduce output as previous income levels can be maintained with a smaller number of nursing home visits. We would still expect a reallocation of time away from office and hospital visits, however, as physicians substitute time in the relatively higher paying nursing home category.

Sociodemographic Characteristics

Sociodemographic characteristics include age and race, defined for the physician's county. The variables, OVER65 and WHITE, are defined as the percent of population 65 years and older, and white, respectively. An older population will increase the demand for physician nursing home visits, as elderly persons are more likely to be placed in nursing homes. Racial discrimination and cultural differences are expected to discourage entry of nonwhite patients to nursing homes, even though the poorer health status and Medicaid eligibility of a nonwhite population would tend to increase demand. Thus, physicians will see more nursing home patients in predominately white communities.

Health Status

Patient health status (HEALTH) is proxied by the age and sex-adjusted mortality rate for the elderly, defined for the physician's county. Higher mortality rates will increase the demand for physician nursing home visits, ceteris paribus, as more seriously ill persons substitute institutional for noninstitutional care.

Ability to Pay

Two variables measure ability to pay: income and health insurance coverage. Income (Y) is defined as per capita income (in thousands) in the physician's county and is hypothesized to shift the demand curve for all types of visits outwards. Income elasticities may be low or even negative for nursing home visits, however, as richer persons demand more ambulatory care.

Health insurance coverage is also hypothesized to increase the demand for physician nursing home visits, and is measured by Medicaid eligible patients as a percentage of county population. (The proportion of persons eligible for Medicare is captured by the percent of population 65 years and older.) No data on Medicaid enrollments are available below the state level, but data on the percentage of population below poverty are available by county from the 1970 U.S. Census. Taking each state's mean poverty proportion as 1.0, we developed a poverty index for counties in that state (for counties in our sample). This index multiplied by 1977 state estimates of Medicaid patients as a percentage of population yielded our Medicaid coverage variable (MCAID) for the survey year.

Ideally, we would also like a measure of the proportion of county population with private medical or major medical health insurance. Unfortunately, these data are not available at the micro-level. Since 85 percent of the nursing home population is over 65 years of age and hence eligible for Medicare, however, private health insurance will not be a major factor in the demand for physician nursing home visits.

Availability of Substitute Sources of Care

The relative availability of alternative sources of care will influence both the demand for, and supply of, visits. These substitutes are measured by the female labor force participation rate and by the relative supplies of nursing home and acute care beds. The female labor force participation rate (LFPART) is measured by the percent of adult women who are employed, defined for the physician's county. Adult women are potential care-givers for elderly relatives living at home. The higher their rate of labor force participation, the greater will be the substitution of nursing home care for noninstitutional care, and hence the demand for physician nursing home visits.

Nursing home care is a potential substitute for hospital care, and the physician's choice of treatment locus will depend in part upon the relative supplies of nursing home and acute care beds. BEDR is defined as the ratio of nursing home beds to short-term hospital beds in the physician's county. Physician time allocation to nursing home visits will be positively related with BEDR.

Physician Credentials

Three variables measuring the physician's credentials will influence his willingness to see nursing home patients: specialty, board-certification, and whether he is a foreign medical school graduate. Specialist physicians embody a greater amount of professional training and technical expertise than do general practitioners, and will face greater demand for their services. They thus will be able to dominate the high-technology settings, relegating general practitioners in part to secondary markets. General practitioners are hypothesized to allocate more time to nursing home visits than do internists and cardiologists. The dummy variables IM and CARD represent internists and cardiologists, respectively. General practitioners represent the omitted category.

Board-certified physicians and U.S. medical graduates are both generally considered to be of higher technical quality, and hence face a greater demand for their services. As a result, they are hypothesized to spend less time in secondary markets. BOARD and FMG both assume the value one if the physician is board-certified, or if he is a Third World FMG. A Third World FMG is defined as a graduate of a medical school in a non-English-speaking, non-Western European country. (An exception is made for graduates of Mexican medical schools, many of whom are Americans who studied there.)

Physician Age

The older physician is likely to face a drop in demand for

his services in the primary market, as referring physicians increasingly opt for younger physicians more fully acquainted with the latest medical techniques. As a result, older physicians are hypothesized to shift more of their work effort into secondary market activities. MDAGE is specified as a dummy variable that assumes the value one if the physician is sixty years of age or older.

Practice Costs

Practice costs include the cost of the physician's time and the wage rate for nonphysician labor inputs. Time costs incurred in traveling from office to nursing home are proxied by nursing home density (the number of SNFs and ICFs per square mile) per physician. Where this ratio (TRAVEL) is high, travel costs are lower, as distances are shortened and physicians have greater flexibility in placing patients in convenient facilities. Thus, TRAVEL will be positively related to nursing home visits.

Office visits generally require substantial inputs of nonphysician time. An increase in input prices will raise the costs of office practice and will encourage the substitution of nursing home visits. Physicians are thus hypothesized to allocate more time to nursing home visits when wage levels are high. WAGE is defined as a county index of weekly wage rates of nonphysician personnel.

Physician-Population Ratio

MDPOP is defined as the number of office-based physicians per 1,000 county population. As this ratio rises, a presumably fixed number of office (hospital) visits are spread across more physicians, lowering the marginal revenue product to office (hospital) visits. This drop in demand will encourage movement into the nursing home market, as physicians seek to restore previous income levels. The physician-population ratio is thus hypothesized to be positively related to nursing home visits. A negative (or zero) coefficient for MDPOP, on the other hand, would be interpreted as evidence that physicians can shift demand for office and/or hospital visits. To the extent that physicians can induce demand for their services, or alternatively, produce a "better" (i.e., longer) office visit, they will be able to regain previous income levels without providing nursing home visits. This behavior will be further reinforced by the secondary market characteristics of nursing homes.

Practice Characteristics

The number of nursing home visits a physician makes will depend in part upon his work effort. Since total hours worked is endogenous to the supply of nursing home visits, exogenous variables explaining his hours worked decision are included on the right-hand side of the visits equations.

Some of these variables have been discussed above, i.e., physician age, and the physician- population ratio. Two variables, nonpractice income and number of children, unfortunately were not included in the 1976 physician survey. Characteristics of the physician's practice, such as mode of payment and revenue-sharing arrangements, also may influence work effort. Both salaried and income-sharing physicians were hypothesized to make fewer nursing home visits, as overall work effort is reduced. These variables were insignificant in preliminary regressions, however, and dropped from further analysis.

Estimation Methods

In the 1976 survey, the proportion of physicians making no nursing home visits was 0.53. In these instances, the dependent variable (proportion of total visits spent with nursing home patients) is zero. Estimated parameters using ordinary least square (OLS) will be biased towards zero, however, when the dependent variable is continuous and there is a concentration of values at a lower limit (Goldberger, 1964). In order to overcome this problem, "Tobit" analysis was used. Using Tobit, one estimates an index that simultaneously determines both the probability of observing a nonzero value for the dependent variable and the dependent variable's expected value conditional on a set of exogenous variables. Similarly, with a qualitative, zero-one, dependent variable (0=no nursing home visits, 1 = positive visits), OLS methods are inefficient because of the concentration of values at two extremes. Multivariate probit analysis is preferred here because it constrains the predicted values of the dependent variable to the unit (0,1) interval (Goldberger, 1964).

Interpretation of Tobit and probit results, however, is a two-step process, unlike OLS estimates which have direct implications (e.g., the coefficient of income in a consumption function is the marginal propensity to consume). Estimates must first be converted using the cumulative normal distribution before impacts on conditional probabilities can be determined. Signs of coefficients and statistical significance do give direction of effects on probabilities, however.

Finally, the NHRATIO equation (proportion of all visits in nursing homes) will be estimated for those physicians with positive responses only i.e., physicians who report at least one nursing home visit during the previous week. Here, OLS is an appropriate and efficient estimation technique.

Econometric Findings for Nursing Home Visits

Four regression equations and means for the dependent and all explanatory variables are displayed in Table V-3. OLS regression results (reg. 3) have been included for comparative purposes; where there are differences, greater reliance should be placed on the Tobit results (reg. 2). Although the regressions leave much of the variation unexplained, many of the coefficients are statistically significant in the hypothesized direction. Certain parameter estimates, however, change in magnitude or sign between the probit and the Tobit equations, suggesting behavioral differences in (1) the decision to supply any nursing home visits, and (2) the proportion of time allocated to these visits, conditional on (1).

Because the probit and Tobit coefficients are not directly interpretable, a table of marginal impacts of selected, statistically significant variables is provided (Table V-4). Elasticities are calculated for continuous variables, marginal effects for discrete, dummy variables. For example, a one percent increase in the ratio of nursing home beds to hospital beds (BEDR) results in a 0.15 percent increase in the probability that the physician enters the nursing home market. Marginal effects simply give the absolute change in the probability of supplying nursing home visits associated with positive values of the discrete independent variables. Thus, being 60 year or older increases the proportion of total visits spent seeing nursing home patients by one percentage point (around a mean of 3 percent).

Higher nursing home visit fees relative to office fees appear to have no impact on physician willingness to see nursing home patients, ceteris paribus. The reimbursement variable (NHFEE-R) does not attain significance in any of the regression equations. This may be explained in part by the fact that there is simply little variation in these relatives; in fact, the Medicare charge for a multiple patient nursing home visit cannot exceed that for an office visit. (When the higher Medicare prevailing charge for a single patient nursing home visit was substituted for the multiple patient charge in the fee ratio, NHFEE-R remained insignificant.) Measures of travel time included in these equations, furthermore, may have provided only a partial adjustment for the high time costs associated with nursing home visits, and thus the fee coefficient may be biased downward (Acton, 1975).

Physicians supplying nursing home visits have fewer credentials on average, indicating that nursing homes are in fact a secondary market for their services. Less highly specialized physicians, older physicians, and Third World medical school graduates appear to dominate the nursing home market. Internists and general practitioners are significantly more likely to provide nursing home visits, with cardiologists, the most highly trained specialist group in the sample, preferring to spend their time in the office and hospital. Foreign medical graduates from Third World countries also make many more nursing home visits; the average FMG devoted 17 percent of his total caseload to nursing home patients compared with three percent for U.S. or Western European graduates. Physicians 60 years of age and over also appear to allocate disproportionately more visits to the nursing home setting than do younger physicians,

Table V-3:

REGRESSION RESULTS FOR PHYSICIAN NURSING HOME VISITS
(t-values in parentheses)

Variables	Regressions ^a				Means ^b
	1. Probit (NH)	2. Tobit (NHRATIO)	3. OLS (NHRATIO)	4. OLS (NHRATIO, pos. responses Only)	
NH	-	-	-	-	0.45
NHRATIO	-	-	-	-	0.03
NHFEE-R	-3.36 (-0.15)	7.54 (0.35)	0.36 (0.21)	1.03 (0.31)	1.04
OVER65	-97.26 (-0.55)	-128.34 (-0.81)	1.80 (0.14)	26.32 (1.00)	0.10
WHITE	-64.38 (-1.54)	92.37 (2.37)**	6.42 (2.12)**	11.69 (1.84)*	0.88
HEALTH	16.38 (1.99)**	0.37 (0.05)	-0.19 (-0.33)	-1.30 (-1.04)	5.89
Y	0.00 (0.15)	-0.00 (-0.07)	-0.002 (-0.03)	-0.05 (-0.45)	5.25
MCAID	-142.47 (-0.65)	185.18 (0.91)	11.40 (0.73)	52.15 (1.61)	0.05
LFPART	-47.98 (-0.38)	124.38 (1.08)	4.50 (0.51)	6.61 (0.34)	0.40
BEDR	14.38 (3.00)***	9.47 (2.58)***	0.23 (0.73)	0.55 (0.89)	1.10
CARD	-54.49 (-2.33)**	-56.72 (-2.50)**	-0.16 (-0.10)	1.22 (0.03)	0.05
IM	-0.20 (-0.02)	20.36 (2.05)**	1.32 (1.72)*	2.33 (1.40)	0.32
BOARD	13.32 (1.18)	5.53 (0.53)	-0.84 (-1.05)	-2.72 (-1.60)	0.26
FMG	45.01 (2.68)***	39.58 (2.63)***	0.11 (0.89)	0.03 (0.00)	0.08
MDAGE	20.82 (2.14)**	20.19 (2.28)**	1.61 (2.28)**	2.91 (2.02)**	0.35
WAGE	-4.37 (-2.00)**	-0.80 (-0.43)	-0.01 (-0.04)	0.13 (0.43)	4.83
TRAVEL	69.32 (0.73)	61,051.81 (3.51)***	39.44 (5.64)***	43.90 (4.08)***	0.0002
MDPOP	8.64 (0.62)	20.02 (1.54)	0.96 (0.95)	1.59 (0.76)	1.03
CONSTANT	-36.10 (-0.38)	-215.05 (-2.52)**	-7.45	-7.97	

 $\sigma=0.10$ $R^2(c)=.05$ $R^2(c)=.07$ $F(16,774)=3.65^{**}$ $F(16,340)=2.73^{*}$ ^a Coefficients are multiplied by 100^b Corresponds to sample in regs. 1-3.

*Significant at 10 percent level

**Significant at 5 percent level

***Significant at 1 percent level

Table V-4:

IMPACT OF INDEPENDENT VARIABLES
ON PHYSICIAN NURSING HOME VISITS

Variable	<u>Elasticity^a</u>			<u>Marginal Effect</u>		
	Probit	Tobit	OLS (pos. resp. only)	Probit	Tobit	OLS (pos. resp. only)
NHFEE-R	b	b	b	-	-	-
OVER65	b	b	b	-	-	-
WHITE	b	+70.33	+3.43	-	-	-
HEALTH	+0.90	b	b	-	-	-
Y	b	b	b	-	-	-
MCAID	b	b	b	-	-	-
LFPART	b	b	b	-	-	-
BEDR	+0.15	+3.54	b	-	-	-
CARD	-	-	-	-0.20	-0.001	b
IM	-	-	-	b	+0.01	b
BOARD	-	-	-	b	b	b
FMG	-	-	-	+0.18	+0.14	b
MDAGE	-	-	-	+0.08	+0.01	+0.03
WAGE	-0.20	b	b	-	-	-
TRAVEL	b	+3.91	+0.29	-	-	-
MDPOP	b	b	b	-	-	-

a A 10 percent increase was assumed for each independent variable.

b Independent variable was insignificant.

Note: Tobit elasticities may be relatively high due to small calculated values for the probabilities.

about one percentage point more on average. The positive-respondents only equation (reg. no. 4) implies an even larger marginal effect for MDAGE. The final credential variable, board-certification, has no impact, however, on the decision to make nursing home visits.

As internists have more training than general practitioners, it is puzzling to observe that they spend a significantly larger portion of their caseload with nursing home patients. Casemix may provide at least a partial explanation. Cardiologists and internists compete directly with each other in the care of elderly and cardiac patients.* The higher demand faced by cardiologists allows them to see these patients in their offices and hospitals, leaving the internists to visit them in the nursing home setting.

Traditional demand variables, such as ability to pay, generally were not significant predictors of physician willingness to make nursing home visits. Per capita income (Y) and percentage of population on Medicaid (MCAID) were insignificant in all equations. Most nursing home patients enjoy almost full insurance coverage for physician visits under Medicare and hence, there may be little residual variation in ability to pay to be explained by these two variables. Surprisingly, the proportion of elderly residing in the county does not appear to affect the demand for nursing home visits. BEDR may completely capture this effect, as the supply of nursing home beds is likely to be greater in communities with a large elderly population. Nursing home residents are disproportionately white, and the proportion of county population white is positive and significant as predicted in three of the four equations. Declining health status was hypothesized to raise the demand for nursing home care and thus for physician visits. Increases in mortality rates for the elderly (HEALTH) do significantly increase the probability that a physician will enter the nursing home market, but have no effect on the number of visits supplied.

Two variables were included to measure the availability of substitute sources of care: the labor force participation rate for women (LFPART), and the ratio of nursing home beds to acute hospital beds (BEDR). LFPART is insignificant in all equations, in contrast to Chiswick (1976) who found that nursing home care was an important substitute for the care of a female relative. Nursing home care does appear to substitute for hospital care, however. Where the supply of nursing home beds is high relative to hospital beds, physicians provide a significantly larger proportion of their visits in the nursing home setting.

The physician's time allocation decision appears to vary with practice

* Internists and cardiologists devote a large share of their office practice to elderly patients, 30 percent and 40 percent respectively (NCHS, 1978a, c), compared with only 18 percent for general practitioners (NCHS, 1977). Similarly, diseases of the circulatory system are the most frequent principal diagnoses in the office practices of internists and cardiologists, accounting for 25 percent and 51 percent of all visits, respectively. By contrast, only 12 percent of the general practitioner's practice is spent with cardiac patients. (Diseases of the circulatory system are the most prevalent diagnoses in nursing homes, affecting 37 percent of all residents (NCHS, 1978b).)

costs, but not always in the hypothesized direction. It had been hypothesized that in areas of high wage rates for auxillary personnel, physicians would reallocate visits from their office practices to the less costly nursing home settings. High labor costs, however, actually reduce the probability that a physician will enter the nursing home market, and have no effect on the proportion of visits supplied there. Travel costs have a significant impact on the extent to which a physician makes nursing home visits as predicted. In areas of high nursing home density per physician (and thus low travel cost) physicians devote a larger share of their practice to nursing home patients.

Finally, increased competition, as measured by high physician density (MDPOP), does have a positive effect on nursing home visits, and is almost significant in the Tobit equation. As the nursing home market does appear to be served by less well trained physicians on average, however, we had hypothesized a stronger impact for the physician-population ratio. There are two possible explanations for the null MDPOP coefficient. First, to the extent that physicians can induce demand for their services in the office and hospital, they can avoid moving into the less attractive nursing home market. We would expect physicians' aversion to nursing home visits to simply reinforce any such effect. Second, the MDPOP variable may contain some measurement error, as it was comprised of all office-based patient care physicians in the survey physician's county. As this variable included specialists, such as surgeons, who do not compete directly with the three specialist groups in our sample, it may have biased the MDPOP coefficient toward zero. Unfortunately, detailed specialty-specific data were not available at the county level.

VI ANALYSIS OF HOUSE CALLS

Descriptive Analysis of House Calls

Physicians were divided into three groups for initial comparisons: (1) those who made no house calls during the past week; (2) those making four or less; and (3), those with five or more house calls. The analyses included only general practitioners and internists. Over one-half of sample physicians (57%) had made no house calls during the reference week. The remaining physicians devoted three percent of their practice to patients at home, averaging four house calls per week.

Characteristics of these physicians are compared in Table VI-1. Not surprisingly, the majority of internists (76%) report they made no house calls during the previous week. Over one-half of general practitioners, on the other hand, had made at least one house call, and 15 percent made five or more. Board-certified physicians were less likely to make house calls as expected, but this may simply reflect specialty differences. Graduates of Third World medical schools also appear less likely to visit patients in their homes. Again, this may be a specialty effect, as FMGs are less often general practitioners. Physicians 60 years of age and older do appear to supply more house calls than their younger colleagues. As many of these physician characteristics are intercorrelated, it is difficult to determine which characteristics are independently associated with the willingness to make house calls. Econometric analysis presented in the following section will allow us to test the significance of these physician characteristics, while holding other factors constant.

It was hypothesized that physicians would be more willing to make house calls in urban areas, as travel times would be shorter. Offsetting this however, is an increased demand for house calls in rural areas, due to transportation difficulties. The latter effect appears to dominate, as shown in Table VI-2. The willingness of physicians to make house calls appears to be inversely related with population density. Almost two-thirds of physicians in large metropolitan areas make no house calls, compared with less than one-half of those in non-metropolitan areas. Physicians in the North East, and South appear far more likely to make house calls, furthermore, than do their colleagues in the North Central and West census areas. The greater willingness of Southern physicians to make house calls may simply reflect higher demand in the more sparsely populated South. The large proportion of physicians making house calls in the densely populated North East is puzzling, but may be explained by interregional variations in other factors expected to influence the supply of house calls, such as physician-population ratios and nursing home beds per capita. Econometric analysis presented below will allow us to examine this more closely.

TABLE VI-1:

CHARACTERISTICS OF PHYSICIANS
MAKING HOUSE CALLS
(percentage distribution)

	Visits per Week			
	None (57.1%)	1 - 4 (31.6%)	5 + (11.2%)	Total
<u>Specialty</u>				
General Practice	56.2/47.9	79.3/37.3	88.4/14.8	/100%
Internal Medicine	43.8/76.1	20.7/19.9	11.6/ 4.0	/100%
Total	100%/	100%/	100%/	
<u>Board-Certified</u>				
Yes	28.4/68.7	19.0/25.5	12.3/ 5.8	/100%
No	71.6/53.6	81.0/33.5	87.7/12.9	/100%
Total	100%/	100%/	100%/	
<u>Medical School</u>				
Third World	9.4/69.5	6.8/27.9	1.8/ 2.6	/100%
U.S./Other	90.6/56.1	93.2/31.9	98.2/12.0	/100%
Total	100%/	100%/	100%/	
<u>Age</u>				
60 Years +	34.0/53.2	29.4/25.4	69.7/21.4	/100%
Under 60	66.0/59.4	70.6/35.2	30.3/ 5.4	/100%
Total	100%/	100%/	100%/	

TABLE VI-2:

GEOGRAPHIC LOCATION OF PHYSICIANS
MAKING HOUSE CALLS
(percentage distribution)

	Visits per Week			
	None (57.1%)	1 - 4 (31.6%)	5 + (11.2%)	Total
<u>Practice Location</u>				
Large Metropolitan	45.4/64.8	33.9/26.9	29.5/ 8.3	/100%
Small Metropolitan	35.9/54.2	42.4/37.3	26.7/ 8.5	/100%
Non-Metropolitan	20.7/48.8	23.8/30.9	43.8/20.3	/100%
Total	100%/	100%/	100%/	
<u>Region</u>				
North East	19.5/41.6	35.1/41.4	40.4/16.9	/100%
North Central	27.0/65.1	19.9/26.5	17.9/ 8.5	/100%
South	23.0/48.8	30.0/35.1	38.5/16.0	/100%
West	30.4/77.2	15.0/21.1	3.2/ 1.6	/100%
Total	100%/	100%/	100%/	

Econometric Analysis of House Calls: Empirical Specification and Estimation

Empirical specification of the house calls equations is very similar to that of nursing home visits. Only differences will be noted here. All nursing home variables are omitted, and the Medicare prevailing charge for a house call replaces the nursing home visit prevailing.

Substitute sources of care include nonemployed adult women and nursing home beds. High labor force participation rates for adult women will increase house calls, as the elderly and disabled will be unable to travel to the physician's office without assistance. LFPART is hypothesized to be positively related to the proportion of visits allocated to house calls. In communities with more nursing home beds per capita, physicians are more likely to substitute nursing home care for their own care, and hence NHBEDS will be negatively correlated with house calls.

Urbanization will have two offsetting effects. Physicians' travel costs should be greatly reduced in urban communities, thus encouraging house calls. Population density, the county population (in thousands) per square mile (POPSQMI), is used as a proxy for urbanization. At the same time, demand for house calls will be greater in rural areas, where elderly patients have particular difficulty in travelling to the physician's office. Which effect dominates will be tested empirically.

Finally, physicians may be less willing to travel in communities perceived as dangerous. House calls are hypothesized to be performed less frequently in counties with a large nonwhite population.

Estimation methods for the house calls equations are similar to those used for nursing home visits. Where the dependent variable is specified as the proportion of total visits allocated to house calls (HCRATIO), Tobit analysis is used. Multivariate probit is used with the zero-one dependent variable (0= no house calls, 1= positive calls). Finally, the HCRATIO equation is estimated using OLS for the sample of physicians reporting at least one house call.

Econometric Findings for House Calls

Four regression equations and means for all variables are presented in Table VI-3, in an identical format to that used for nursing home visits. These OLS regressions explain a much larger share of the variance than those for physician nursing home visits, however; this suggests that the model may better fit this particular allocation decision, that the explanatory variables are better measured, or both. To facilitate interpretation of the house call regressions, marginal impacts for the significant independent variables are displayed in Table VI-4.

Physicians do not appear to supply more house calls when reimbursement levels for house calls are higher relative to those for office visits. The fee variable, the ratio of Medicare prevailing charges for house call and office visit, was insignificant in all equations. Although

TABLE VI-3:

REGRESSION RESULTS FOR PHYSICIAN HOUSE CALL EQUATION
(t-values in parentheses)

Variables	Regressions ^a				Means ^b
	1. Probit (HC)	2. Tobit (HCRATIO)	3. OLS (HCRATIO)	4. OLS (HCRATIO, Pos. responses Only)	
HC	-	-	-	-	0.41
HCRATIO	-	-	-	-	0.01
HCFEE-R	-0.73 (-0.04)	-5.79 (-0.31)	-0.38 (-0.76)	-1.40 (-1.33)	1.58
OVER65	553.88 (2.93)***	652.15 (3.51)***	13.98 (2.91)***	18.07 (1.91)*	0.10
HEALTH	19.15 (1.98)**	5.51 (0.61)	-0.18 (-0.77)	-0.56 (-1.17)	5.88
Y	-0.02 (-2.00)**	-0.01 (-1.33)	-0.04 (-2.12)**	-0.09 (-1.98)**	5.24
MCAID	-466.87 (-1.94)*	-259.25 (-1.14)	-5.15 (-0.85)	-16.91 (-1.40)	0.05
LFPART	579.26 (4.06)***	422.24 (3.31)***	12.99 (3.79)***	22.08 (3.12)***	0.40
NHBEDS	-33.96 (-0.18)	-227.17 (-1.29)	-3.60 (-0.75)	-16.51 (-1.91)*	0.05
IM	-75.02 (-6.19)***	-63.59 (-5.53)***	-0.85 (-2.85)***	(0.94) (1.41)	0.34
BOARD	0.17 (0.01)	-15.37 (-1.29)	-0.25 (-0.79)	-0.59 (-0.88)	0.25
FMG	-19.66 (-0.99)	-39.98 (-1.99)**	-0.27 (-0.57)	-0.66 (-0.59)	0.08
MDAGE	1.52 (0.14)	34.18 (3.23)***	1.15 (4.27)***	2.81 (5.07)***	0.35
WAGE	-4.62 (-1.77)*	-0.65 (-0.27)	0.01 (0.22)	0.49 (3.47)***	4.81
POPSQMI	2.22 (3.36)***	5.09 (5.32)***	0.01 (7.12)***	0.22 (5.51)***	2.82
MDPOP	-3.98 (-0.23)	-13.78 (-0.86)	-0.93 (-2.34)**	-2.67 (-2.84)***	1.01
WHITE	158.54 (2.95)***	124.29 (2.41)**	2.74 (2.15)**	3.74 (1.34)	0.88
CONSTANT	-398.81 (-3.53)***	-302.04 (-2.80)***	-2.91	-0.67	

 $\sigma = 0.06$ $R(c) = 0.18$ $R(c) = 0.34$ $F(15, 679) = 10.97***$ $F(15, 269) = 10.75***$ ^a Coefficient multiplied times 100^b Corresponds to sample in regs. 1-3.

*Significant at 10 percent level

**Significant at 5 percent level

***Significant at 1 percent level

Table VI-4:

IMPACT OF INDEPENDENT VARIABLES
ON PHYSICIAN HOUSE CALLS

Variable	<u>Elasticity^a</u>			<u>Marginal Effect</u>		
	Probit	Tobit	OLS (pos. resp. only)	Probit	Tobit	OLS (pos. resp. only)
HCREE-R	b	b	b	-	-	-
OVER65	+0.52	+32.70	+1.81	-	-	-
HEALTH	+1.05	b	b	-	-	-
Y	-0.01	b	-0.47	-	-	-
MCAID	-0.21	b	b	-	-	-
LFPART	+2.17	+8.77	+8.83	-	-	-
NHBEDS	b	b	-0.83			
IM	-	-	-	-0.28	-0.42	b
BOARD	-	-	-	b	b	b
FMG	-	-	-	b	-0.22	b
MDAGE	-	-	-	b	+0.33	+0.03
WAGE	-0.20	b	+2.36	-	-	-
POPSQMI	+0.07	+1.11	+0.62	-	-	-
MDPOP	b	b	-2.70	-	-	-
WHITE	+1.31	+5.83	b	-	-	-

a A 10 percent increase was assumed for each independent variable.

b Independent variable was insignificant.

Note: Tobit elasticities may be relatively high due to small calculated values for the probabilities.

house call fees average 50 percent more than office fees, they may still be too low to offset the travel costs involved in visiting patients' homes.

The house call market is dominated by less well trained physicians, particularly older general practitioners, indicating that it too is secondary in terms of physician preferences. Internists are significantly less likely to allocate time to house calls than are general practitioners. Estimated marginal effects for the IM variable are quite large; being an internist reduces the probability that a physician will enter the house call market by 28 percentage points. Even holding specialty constant, furthermore, physicians 60 years of age and over devote a significantly larger proportion of their caseload to house calls, than do younger physicians. BOARD, whether a physician is board-certified, is also in the hypothesized (negative) direction but does not attain statistical significance.

It had been hypothesized that, due to their perceived inferior training, graduates from Third World medical schools would be more willing to make house calls. Even holding specialty constant, however, Third World FMGs are no more likely than other physicians to enter the house call market and actually allocate significantly less time there. The uneven geographic distribution of FMGs may be a partial explanation for this unexpected finding. The descriptive results presented earlier showed that physicians making house calls were disproportionately located in rural communities and in the South, areas that traditionally have attracted few FMGs (Lowin, 1975). Variables included in the house call regressions, such as population density, may not have adequately controlled for such geographic effects. In addition, cultural differences may inhibit some FMGs from visiting patients in their homes.

Community demand variables were generally significant in the hypothesized directions. Physicians are significantly more likely to make house calls in areas that have a large proportion of elderly persons (OVER65), and where the elderly are generally in poorer health (HEALTH). Estimated elasticities were quite high; a one percent increase in the percentage of county population 65 years and over raises the proportion of total visits devoted to house calls by 33 percent. High per capita income lowers the probability that a physician will make house calls; the increased demand for house calls is apparently more than offset by an increased demand for the more preferable office visits. Physicians are less likely to make house calls in high Medicaid areas, however. Medicaid coverage of house calls may be so limited as to be nonexistent in many states.

The availability of substitute sources of care influences both the demand for, and supply of, house calls. Where the labor force participation rate of women is high, the elderly and disabled may lack a relative to drive them to the physician's office, and it was hypothesized that the demand for house calls would be high in those areas. LFPART is significant and positive in all equations; physicians do allocate more time to house calls when patients are unable to reach their office. Nursing home care may substitute for the physician's services, and physicians apparently supply fewer house calls in areas with more nursing home beds per capita, although NHBED is significant only in the

positive respondents equation.

Two variables were included to measure the practice costs of different visit types: wage rates for nonphysician personnel, and population density (a proxy for travel time). High labor costs were hypothesized to encourage physicians to make non-office visits, such as house calls. The wage rate variable significantly lowers the probability that a physician enters the house call market, however (although its elasticity is quite low), and we are unable to explain this unexpected finding. In the positive respondents only equation, furthermore, the coefficient for the WAGE variable is significant in the hypothesized direction. A one percent increase in area wages for nonphysician labor results in a 2.4 percent increase in the proportion of time allocated to house calls, for physicians already in this market. Travel costs should be reduced in areas of high population density, and consequently physicians will be more willing to make house calls. Due to transportation difficulties, on the other hand, the demand for house calls may be greater in rural areas. The former effect clearly dominates. The POPSQMI coefficient is positive and significant in all equations.

In areas with high physician population ratios, physicians were hypothesized to be more likely to enter the house call market, due to competition in the primary office and hospital market. In fact, however, the MDPOP coefficient is negative, and significantly so in the positive respondents only equation. As discussed in the nursing home visit analysis, there are two possible explanations for a negative or zero MDPOP coefficient; demand shift, or measurement error in the MDPOP variable.

Finally, physicians were hypothesized to be more willing to visit patients' homes in communities where they felt safe. This proved to be the case. Physicians are significantly more likely to make house calls in areas where a large proportion of the county population is white.

VII. CONCLUSIONS AND POLICY IMPLICATIONS

Policymakers have become increasingly concerned that certain segments of the elderly population may not be receiving adequate medical care. Many physicians have abdicated responsibility for nursing home patients, seriously jeopardizing the quality of care as a result. In addition, fewer and fewer physicians are willing to make house calls, reducing access for the homebound elderly. This reluctance of physicians to make nursing home visits and house calls was further documented in this study. Only 47 percent of sample physicians had made any nursing home visits during the previous week of practice, and 43 percent any house calls. This is an overestimate for patient care physicians generally, as those specialties making very few of these types of visits were excluded from the analysis a priori.

It had been hypothesized that nursing home and house call visits are a secondary market for physician services, characterized by low "pay", poor working conditions, and few opportunities for advancement. Physicians enter this market only when forced to do so by competition. As a result, physicians in the nursing home and house call markets were hypothesized to be less well trained on average than other physicians. The findings presented in the previous two chapters confirm these hypotheses. Physicians supplying nursing home visits and house calls do have fewer credentials than other physicians, ceteris paribus. Better trained physicians face a greater demand for their services and apparently are able to exercise their preference to practice solely in the office and hospital market.

There is some variation in the characteristics of physicians making nursing home visits and house calls, however, suggesting that the secondary market itself may be segmented. The source of this segmentation is unclear, but might be attributed, for example, to cultural differences in physician preferences. The nursing home market is disproportionately served by older physicians, by internists and general practitioners, and by Third World foreign medical graduates. The house call market, on the other hand, is made up primarily of older, general practitioners, and U.S./Western European medical school graduates. The extent of overlap between physicians making either of the two types of visits is nevertheless considerable.

It had also been hypothesized that physicians would be more willing to make nursing home visits and house calls when reimbursement levels for these visits were high relative to those for office visits. In fact, however, physicians appear to be insensitive to these relative prices within the observed range. Although nursing home and house call reimbursement levels average as much or more as those for office visits, they are still too low to offset the high travel costs associated with making these two types of visits. Physicians were found to be more likely to make nursing home visits and house calls when travel distances were shorter.

These findings suggest that policymakers may be fairly limited in the tools they can use to encourage physicians to make nursing home

visits and house calls. Increased physician specialization will clearly reduce access of nursing home and house bound patients to medical care. Policies directed toward the reallocation of residencies to primary care, such as the 1976 Health Professions Educational Assistance Act, may help, as general practitioners are more likely to visit patients in their homes, and together with internists, in nursing homes. That same act, however, abolishes the preferential immigration status for FMGs, thus reducing an important source of care for nursing home patients.

What has been
It would appear that only very large increases in reimbursement levels will induce physicians into the secondary market. How large we are unable to determine from this analysis. An intermediate approach might be to eliminate the current two-tiered method of reimbursement for nursing home visits under Medicare and Medicaid.

REFERENCES

- Acton, Jan. "Nonmonetary Factors in the Demand for Medical Services: Some Empirical Evidence", Journal of Political Economy 83:595-614, June 1975.
- AFL-CIO, America's Nursing Homes: Profit in Human Misery, Washington, D.C.: AFL-CIO, 1977.
- Bishop, Christine et al., Prospective Reimbursement for Nursing Home Care: Industry Behavior and Regulatory Objectives. Technical Paper prepared for the Social Security Administration, Cambridge (MA): Abt Associates, Inc., July 1977.
- Carol, Marjorie Smith, "Private Health Insurance in 1976: An Evaluation," Social Security Bulletin 41: 3-16, September 1978.
- Chiswick, Barry R., "The Demand for Nursing Home Care: An Analysis of the Substitution Between Institutional and Noninstitutional Care," The Journal of Human Resources, 11: 295-316, Summer 1976.
- Colombotos, John, "Physicians' Response to Changes in Health Care: Some Projections," Inquiry 7: 20-26, March 1971.
- Congressional Budget Office, Long Term Care for the Elderly and Disabled, The Congress of the United States, Congressional Budget Office, Washington, D.C., February 1977.
- Elford, Wayne, et al., "A Study of House Calls in the Practices of General Practitioners," Medical Care, 10: 173-178, March - April 1972.
- Evans, Robert G., "Supplier - Induced Demand: Some Empirical Evidence and Implications," pp. 163-73, in Mark Perlman, ed. The Economics of Health and Medical Care, N.Y.: John Wiley and Sons, 1974.
- Feldstein, Martin S., "The Rising Price of Physicians' Services," The Review of Economics and Statistics, 52: 121-133, May 1970.
- Feldstein, Martin., "An Econometric Model of the Medicare System," Quarterly Journal of Economics 85: 1-20, February 1971.
- Frank, Kenneth D., "Government Support of Nursing Homes," New England Journal of Medicine, 287: 538-45, September 14, 1972.
- Freidson, Elliot, Profession of Medicine, N.Y.: Harper and Row, 1970.
- Fuchs, Victor R., "The Supply of Surgeons and the Demand for Operations," Journal of Human Resources 13: 35-56, Supplement 1978.
- Gladue, J. Raymond, "The Role of the Physician in the Nursing Home: Past, Present, and Future," Journal of the American Geriatrics Society, 31: 444-9, October 1973.

- Goldberger, A.S., Econometric Theory, N.Y.: John Wiley and Sons, Inc., 1964.
- Gordon, David M., Theories of Poverty and Underemployment, Lexington, MA; Lexington Books, 1972.
- Gornick, Marion, "Medicare Patients: Regional Differences in Length of Hospital Stays, 1969-71," Social Security Bulletin, 38: 16-32, July 1975.
- Kane, Robert L., et al., "Is Good Nursing Home Care Feasible?" JAMA, 235: 516-19, February 2, 1976.
- Kastenbaum, R.S., and S. Candy, "The Four Percent Fallacy: A Methodological and Empirical Critique of Extended Care Facility Program Statistics," Aging and Human Development, 4: 15-21, 1973.
- Lowin, Aaron, FMGs? An Evaluation of Policy-Related Research. Final Report prepared for the National Science Foundation, Minneapolis: Inter-Study, May 1975.
- Mark, R.G., et al., "Medical Care to Nursing Home Patients: Evaluation of a New System - the Nursing Home Telemedicine Project," New England Journal of Medicine, in press.
- May, Joel J., "Utilization of Health Services and the Availability of Resources," pp. 131-49, in R. Andersen et al., eds. Equity in Health Services. Cambridge (MA): Ballinger 1975.
- Miller, Dulcy R., et al., "Nurse - Physician Communication in a Nursing Home Setting," The Gerontologist 12: 225-9, Autumn 1972.
- Miller, Dulcy R., et al., "Physicians' Attitudes Toward the Ill Aged and Nursing Homes," Journal of the American Geriatrics Society, 24: 498-505, November 1976.
- Mitchell, Janet B., "Patient Outcomes in Alternative Long-Term Care Settings," Medical Care, 16: 439-52, June 1978.
- Moss, Frank and Val J. Halamandaris, Too Old, Too Sick, Too Bad, Nursing Homes in America, Germantown, Maryland: Aspen Systems Corp., 1977.
- National Center for Health Statistics, Final Estimates from the 1973-74 National Nursing Home Survey, unpublished mimeo, November 1976.
- National Center for Health Statistics, Nursing Homes in the United States: 1973-74. National Nursing Home Survey, NCHS Series 14, No. 17, October 1977a.
- National Center for Health Statistics, "National Ambulatory Medical Care Survey of Visits to General and Family Practitioners, January - December 1975," Advance Data No. 15, December 14, 1977b.
- National Center for Health Statistics, "Office Visits to Internists: National Ambulatory Medical Care Survey, United States, 1975", Advance Data No. 16. February 7, 1978a.
- National Center for Health Statistics, "A Comparison of Nursing Home Residents and Discharges from the 1977 National Nursing Home Survey: United States", Advance Data, No. 29, May 17, 1978b.
- National Center for Health Statistics, "Office Visits to Cardiovascular Specialists, National Ambulatory Medical Care Survey: United States, 1975-76", Advance Data No. 42, October 31, 1978c.

- Newhouse, Joseph and Charles E. Phelps, "New Estimates of Price and Income Elasticities of Medical Care Services," pp. 261-230 in R. Rosett, ed., The Role of Health Insurance in the Health Services Sector, New York: National Bureau of Economic Research, 1976.
- Office of Nursing Home Affairs, Long-Term Care Facility Improvement Study. Introductory Report. ONHA, July 1975.
- Pastore, John O., et al., "Characteristics of Patients and Medical Care in New Haven Area Nursing Homes," NEJM, 279: 13-136, July 18, 1968.
- Pauly, Mark V., "Medical Staff Characteristics and Hospital Costs," Journal of Human Resources 13: 77-111, Supplement 1978.
- Piore, Michael, "The Dual Labor Market: Theory and Implications," pp. 90-4, in David M. Gordon, ed. Problems in Political Economy, Lexington, MA: D.C. Heath, 1971.
- Ruchlin, Hirsh S., et al., "The long-Term Care Marketplace: An Analysis of Deficiencies and Potential Reform by Means of Incentive Reimbursement," Medical Care, 13: 979-91, December 1975.
- Sloan, Frank A., "A Microanalysis of Physicians' Hours of Work Decisions," pp. 302-25 in Mark Perlman, ed. The Economics of Health and Medical Care, London: MacMillan, 1974.
- Sloan, Frank A., "Physician Supply in the Short Run," Industrial and Labor Relations Review 28: 549-69, July 1975.
- Sloan, Frank A., Jerry Cromwell and Janet B. Mitchell, Private Physicians and Public Programs, Lexington, MA: D.C. Heath, 1978
- Sloan, Frank A. and Roger Feldman, "Competition among Physicians," pp. 57-131, in Warren Greenberg, ed. Competition in the Health Care Sector: Past, Present and Future. Federal Trade Commission, March 1978.
- Sloan, Frank A. and John H. Lorant, "The Allocation of Physicians' Services: Evidence on Length-of-Visit," Quarterly Review of Economics and Business 16: 85-103, 1976.
- Sloan, Frank A., Janet B. Mitchell and Jerry Cromwell, "Physician Participation in State Medicaid Programs," Journal of Human Resources, 13: 211-245, Supplement 1978.
- Solon, Jerry, "Medical Care: Its Social and Organizational Aspects, Nursing Homes and Medical Care," New England Journal of Medicine 269: 1067-77, November 14, 1963.
- Solon, Jerry, et al., "Physicians' Participation in Nursing Homes," Medical Care, 12: 486-94, June 1974.
- Stevens, Rosemary, American Medicine and the Public Interest. New Haven: Yale University Press, 1971.
- Tan, Kong Meng, "Foreign Medical Graduate Performance - A Review," Medical Care 15: 822-9, October 1977.

- Townsend, Clair, Old Age: The Last Segregation. Ralph Nader's Study Group Report on Nursing Homes. N.Y.: Grossman Publishers, 1971.
- U.S. Senate, Special Committee on Aging, Subcommittee on Long-Term Care, Nursing Home Care in the United States: Failure in Public Policy, Introductory Report. Washington, D.C.: U.S. Government Printing Office, December 1974.
- United States Senate, Special Committee on Aging, Subcommittee on Long-Term Care. Nursing Home Care in the United States: Failure in Public Policy. Supporting Paper No. 3: "Doctors in Nursing Homes: The Shunned Responsibility," Washington, D.C.: GPO, February, 1975.
- Vahovich, Stephen G., "Physicians' Supply Decision by Specialty: 2SLS Model," Industrial Relations 16: 51-60, February 1977.
- Warburton, W. Jr., et al., "House Call Patterns of New Jersey Family Physicians," Journal of Family Practice 4: 933-8, 1977.
- Wershow, Harold Jr., "The Four Percent Fallacy: Some Further Evidence and Policy Implications," The Gerontologist, 16: 52-55, 1976.
- Willemain, Thomas R., and Roger G. Mark, "The Distribution of Intervals Between Visits as a Basis for Assessing and Regulating Physician Services in Nursing Homes," unpublished working paper, December 1978.

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